SHOULD UNCLE SAM OPERATE MUSCLE SHOALS?

The Pro and Con Monthly

MAY, 1930

History and Status of Muscle Shoals

The Norris Government Operation Resolution

What the House Bill Provides

Pro and Con Discussion

Should the Government Operate Muscle Shoals?

Regular Departments

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The Congressional Digest

The Pro and Con Monthly

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Contents for This Month

Back numbers of The Congressional Digest are indexed in the Readers' Guide

The Congressional Digest

May, 1930 Vol. 9 - No. 5

LEGISLATIVE DEPARTMENT

THE PRO AND CON FEATURE ACTION BY HOUSE AND SENATE LEGISLATIVE NEWS ITEMS

Should Uncle Sam Operate Muscle Shoals?

History of Muscle Shoals
Industrial Potentialities
Muscle Shoals and the Farmer
Provisions of the Norris Resolution
Provisions of the House Resolution
Pro and Con Discussion

President Hoover on Muscle Shoals

From the President's Annual Message to Congress, December 3, 1929.

IT is most desirable that this question should be disposed of. Under present conditions the income from these plants is less than could otherwise be secured for its use, and more especially the public is not securing the full benefits which could be obtained from them.

Dedicated to the Farmers

It is my belief that such parts of these plants as would be useful and the revenues from the remainder should be dedicated for all time to the farmers of the United States for investigation and experimentation on a commercial scale in agricultural chemistry. By such means advancing discoveries of science can be systematically applied to agricultural need, and development of the chemical industry of the Tennessee Valley can be assured.

I do not favor the operation by the Government of either power or manufacturing business except as an unavoidable by-product of some other major public purpose.

Leasing Favored

Any form of settlement of this question will imply entering upon a contract or contracts for the lease of the plants either as a whole or in parts and the reservation of facilities, products, or income for agricultural purposes. The extremely technical and involved nature of such contracts dealing with chemical and electrical enterprises added to the unusual difficulties surrounding these special plants, and the rapid commercial changes now in progress in power and synthetic nitrogen manufacture, lead me to suggest that Congress create a special commission, not to investigate and report as in the past, but with authority to negotiate and complete some sort of contract or contracts on behalf of the Government, subject, of course, to such general requirements as Congress may stipulate.

Chronology of Muscle Shoals 1824-1929

1824—John C. Calhoun, then Secretary of War, urged a survey of the Muscle Shoals section of the Tennessee River, emphasizing the military necessities of the survey.

1828—The first survey of Muscle Shoals was made, resulting in recommendations for the construction of a canal around that stretch of the river covered by Muscle Shoals.

On May 23, Congress passed an Act donating 40,000 acres of land in the Tennessee Valley to the State of Alabama. The State government was designated as agent to dispose of the land, the proceeds of which were to be used to make the desired improvements at Muscle Shoals. The amount realized from the sale of these lands was $600,000.

1831—Work on the canal around Muscle Shoals was begun.

1836—The canal was opened, but was considered inadequate and was soon abandoned.

1867—Congress began consideration of measures for general river and harbor improvement.

1871—The River and Harbor Act of this year authorized a survey by army engineers for another canal at Muscle Shoals.

1875—The construction of a second canal at Muscle Shoals was authorized and begun.

1890—The second Muscle Shoals canal was completed at a total cost of $3,191,726.50. This is the canal which was closed upon the completion of Wilson Dam and which is referred to as the Obsolete Muscle Shoals Canal.

1899—On March 3, Congress passed an act authorizing the development of Muscle Shoals for navigation and power, granting the authority to "The Muscle Shoals Power Company." This company never availed itself of the privileges accorded by the Act, although its time was extended by three subsequent acts.

1905—In response to a Senate resolution of inquiry, the Secretary of War reported that the Muscle Shoals Power Company had not submitted plans for the authorized improvement. In response to the Senate's request for advice as to the appointment of a commission to study Muscle Shoals with relation to power development, the report stated that the Secretary was "not aware that the United States has any right or interest in the water power that can be developed at the Muscle Shoals, aside from its control over the waterway for purposes of navigatioin and its ownership of the canal property." The appointment of a commission was not recommended.

1907—The River and Harbor Act of March 2 authorized a survey of the Muscle Shoals section of the Tennessee River by a special board of army engineers with a view to improving the river for the development of water power by private or corporate agency by means of not more than three locks or dams.

This authorization came as the result of the introduction in Congress of bills to permit the Muscle Shoals Hydro-Electric Power Company, a subsidiary of the Alabama Power Company, to build three dams at Muscle Shoals for the development of power. The proposal was for joint power and navigation development with the cost to be divided between the power company and the United States Government.

1908—In March the special board of engineers made its report, expressing disapproval of the proposal of the Muscle Shoals Hydro-Electric Power Company on the grounds that the offer was not satisfactory on the question of navigation nor on the size of the investment the power company was willing to make.

1909—In January the special board of engineers made a second report and again disapproved the application of the Muscle Shoals Hydro-Electric Power Company. This report stated that the power company's proposal involved a government subsidy for a venture not at the time commercially practical and far beyond the responsibility of the Government for the improvement of waterways.

1914—In May the Chief of Engineers of the Army transmitted to the House Committee on Rivers and Harbors a report recommending the acceptance of a new proposal of the Muscle Shoals Hydro-Electric Power Company with certain reservations. The report stated that the new offer was more generous than its predecessors and also took into consideration the increasing public demand for the development of the country's water power resources.

1916—In June the army engineers, in response to demands from Congress for further information on the Muscle Shoals project, reported on the results of its reexamination and recommended that an arrangement be entered into with the Muscle Shoals Hydro-Electric Power Company. Attached to the report, however, was a recommendation that all negotiations be suspended because of the provisions of the recently passed National Defense Act.

1916—On June 3, the National Defense Act was passed.

Section 124 of the National Defense Act authorized the construction of nitrate plants by the Government and appropriated $20,000,000 for the purpose. In July, 1916, the Muscle Shoals Association, a public organization, was formed at Nashville, Tenn., to work for the development of Muscle Shoals as a power, navigation and fertilizer project. This organization has since cooperated with the Tennessee River Improvement Association, which was organized in 1896 to work for the improvement of the entire Tennessee River for navigation purposes.

In the spring of 1916 President Wilson appointed a committe of chemical experts, including officers of the army and navy and civilians, known as the Nitric Acid Committee, with instructions to report on the best method of manufacturing nitrates.

1917—On January 27, this committee reported, recommending the immediate development of water-power for the manufacture of nitrates.

1917—On March 16, hearings were begun before an inter-departmental board, composed of the Secretaries of War, Agriculture and the Interior, to determine the location of the Government nitrate plants. On April 6, 1917, the United States declared war and on May 11 a second committee, known as the President's Nitrate Supply Committee, reported in favor of using the Haber process for making nitrates, and recommended that the plants be located in southwestern Virginia and that $3,000,000 be spent in an experimental program.

1917—On September 20, General Crozier, chief of ordnance, fololwing the report of Col. J. W. Joyce, U. S. A., recommended Chattanooga as the site for the location of Nitrate Plant No. 1. On September 24, 1917, President Wilson, upon the request of farm organizations, removed the proposed Nitrate Plant No. 1 from near Pulaski, Virginia, where a site had been chosen, to Muscle Shoals. In November, 1917, the construction of Nitrate Plant No. 2 was begun at Muscle Shoals, and in December arrangements were made with the Alabama Power Company to build a Government unit at its Gorgas Plant for the power at Muscle Shoals.

1918—On February 25, President Wilson authorized the construction of Dam No. 2, setting aside for this purpose $12,000,000 of the $20,000,000 appropriated by Section 124 of the National Defense Act. During 1918 both nitrate plants were completed and in November, 1918, came the Armistice.

1919—In January, A. G. Glasgow was appointed Nitrate Director by President Wilson and directed to arrange for the production of nitrates for fertilizer at the Muscle Shoals Nitrate plants. After an unsuccessful effort to interest private concerns, Mr. Glasgow in October, 1919, submitted a plan for government operation of the Nitrate Plant No. 2. This was embodied in a bill known as the Wadsworth-Kahn bill. Endorsed by farm organizations, this bill passed the Senate in May, 1920, but was lost when adjournment came without its having been considered by the House.

1921—In March, Secretary of War Weeks announced that if he received an offer representing a fair return on the investment necessary to complete the Muscle Shoals project he would send it to Congress, and asked for bids. On April 30, 1921, work was stopped on Dam No. 2 for lack of funds.

1921—On July 8, the proposal of Henry Ford was signed, sent to the Secretary of War, and its terms made public. On November 23 the American Farm Bureau Federation endorsed the Ford proposal. On February 1, 1922, Secretary Weeks transmitted the Ford offer to Congress, and on February 10, the House Committee on Military Affairs began hearings on it. On February 15 the proposal of the Alabama Power Company was sent to the Secretary of War, who transmitted it to Congress on February 21.

1922—On March 25, members of the Senate Committee on Agriculture and the House Committee on Military Affairs made a personal visit to Muscle Shoals. On April 10 the Senate Committee on Agriculture began hearings. On June 24 the Senate adopted the amendment to the army appropriation bill offered by Senator Norris of Nebraska appropriating $7,500,000 for continuing work on Dam No. 2, under the direction of army engineers. On June 24 the House accepted the Senate amendment but made the provision that the funds should not be available until October 1, 1922.

1922—On June 9, the House Committee on Military Affairs reported the McKenzie Bill (H. R. 11903) accepting the Ford bid as revised May 31, 1922. The bill was placed on the calendar, but was not reached by the time the Sixty-seventh Congress adjourned on March 4, 1923.

1922—On July 22, the Senate Committee on Agriculture and Forestry recommended the passage of S. J. Res. 227, rejecting all bids for Muscle Shoals.

1923—On September 24, Secretary of War Weeks sold to the Alabama Power Company the Government's interest in the steam plant at Warrior for $3,472,437.25.

1924—On January 24, Secretary Weeks transmitted to Congress the offer of the Tennessee Electric Power Co., the Memphis Power and Light Co., and the Alabama Power Co., to lease Wilson Dam at an annual rental of $2,000,000 and to lease Dam No. 3, when completed by the Government, at a maximum rental of $1,200,000, furnishing 60,000 horse power for fertilizer manufacture from Dam No. 2 and 40,000 additional from Dam No. 3, and providing $1,000,000 for agricultural research.

On January 25, Secretary Weeks transmitted to Congress a supplemental offer from the same group to organize a corporation to manufacture nitrogen and fertilizers under Nitrate Plant No. 1, retaining Nitrate Plant No. 2 only for National Defense purposes.

1924—On February 2, the House Committee on Military Affairs again reported the McKenzie bill, (H. R. 518), which had been reintroduced, for the acceptance of the Ford offer.

On March 19, the House passed the McKenzie bill.

On June 10, the Senate Committee on Agriculture and Forestry, to which the McKenzie bill had been referred, reported it, amended by striking out the Ford offer and substituting the operation of Muscle Shoals by a Federal Power Corporation.

On June 4, the Senate agreed to the Underwood Resolution to begin consideration of the McKenzie bill, as amended, on December 3, 1924.

On October 18, Henry Ford withdrew his offer for Muscle Shoals.

On December 3, the amended McKenzie bill was brought into the Senate by Senator Norris from the Committee on Agriculture and Forestry. It was further amended by the Senate in conference and failed of passage.

1925—On March 2, the House passed H. Res. 457 requesting the President to procure, through a commission, "such information as, in his judgment, is necessary or desirable in order to determine the best, cheapest and most available means for the production of nitrates" at Muscle Shoals.

1925—On March 24, President Coolidge appointed a commission whose members were: John C. McKenzie, Chairman; Nathaniel B. Dial, Harry A. Curtis, William McClellan, Russell C. Bower, Willis G. Waldo, technologist, and William E. Murray, Secretary.

1925—On November 14, the President's Commission made its report, recommending that private operation would be "the most advantageous course possible both for the Government and for the public."

1926—On March 13, the House passed a concurrent resolution (H. Con. Res. 4), authorizing a Joint Congressional Committee to conduct negotiations for the lease of Muscle Shoals according to the terms set forth in the original McKenzie bill.

On March 15 the Committee was organized.

On April 26, the Committee reported that several bids had been examined, but only two were considered by the Committee—the offer of the Associated Power Companies and the offer of the American Cyanamid Company.

1927—Various bills providing for the acceptance of the offers of the American Cyanamid Company, the Farmers' Federated Fertilizer Co., and the Associated Power Companies for the lease of Muscle Shoals were introduced and discussed in the Senate and House.

On February 2, the House Committee on Military Affairs appointed a subcommittee, headed by Representative W. Frank James of Michigan, the Committee Chairman, to consider the various House bills under the following limitations, set by the full Committee:

(1) That the property be at all times kept available for the production for the Government of nitrates or other ammunition components of munitions of war; (2) that the purchasers or lessees be obligated to manufacture fertilizers in time of peace; (3) that any acceptable offer must be for the entire property, with the exception of the Gorgas steam plant; (4) that strict terms be laid down covering the control of the amount of nitrates to be manufactured; (5) that any bid must contain a provision for the forfeiture of the power and fertilizer rights in the event of failure to manufacture 40,000 tons of nitrates per year.

On March 3, the subcommittee reported to the full committee that none of the offers considered was satisfactory and recommended that if a suitable offer was not received by the time the Seventieth Congress convened in December, 1927, an operating contract for Muscle Shoals should be sought and if none could be arranged, the committee should give full and careful consideration to the operation of Muscle Shoals by a Government Corporation. The full committee adopted the report of the subcommittee on the day it was presented and laid it before the House.

On December 15, the Norris resolution (S. J. Res. 46) providing for the completion of the Muscle Shoals project by the Secretary of War and its operation by the Secretary of Agriculture, with an initial appropriation of $10,000,000, was introduced and referred to the Committee on Agriculture and Forestry.

1928—On January 13, 1928, the House Committee on Military Affairs adopted a resolution to govern the action of the Committee, a resolution similar to the one adopted on February 2, 1927 (see above) containing five essential points.

On February 3, the Norris resolution was reported by the Committee on Agriculture and Forestry.

On March 6, the Norris resolution was passed by the Senate.

On May 23, the House passed the Norris resolution, as amended by the House Committee on Military Affairs. The amendment provided that instead of Muscle Shoals being operated by the Secretary of Agriculture it should be operated by the "Muscle Shoals Corporation of the United States," composed of three members, to be appointed by the President, with an initial appropriation of $10,000,000.

On May 26, the amended Norris resolution had passed both Houses and was sent to the White House.

On May 29, the first session of the Seventieth Congress ended by adjournment. President Coolidge did not sign the Norris resolution at all and as he did not sign it within ten days of the time it reached him his action constituted a "pocket veto". (See CONGRESSIONAL DIGEST for December, 1928.)

1929—On February 16, the House Committee on Military Affairs reported to the House the Madden bill (H. R. 8603) providing for the acceptance of the bid of the American Cyanamid Company. This bill complied with the five essential points set forth by the Military Affairs Committee.

On May 28, the Norris resolution was reintroduced. Reintroduction of the resolution had been held up because of the doubt in the minds of its supporters that the fact that the President had failed to sign it at the end of the First Session of the Seventieth Congress constituted a "pocket veto", their contention being that a "pocket veto" could operate only at the end of the final session of a Congress.

On May 27, the Supreme Court of the United States decided in the case of the Okanogan Indians et al v. the United States that a "pocket veto" at the end of any session of Congress had full effect, which meant, in the case of the Muscle Shoals question that the bill had to be reintroduced.

On June 3, the Senate Committee on Agriculture and Forestry reported the Norris resolution and an agreement was reached to give it consideration immediately following the passage by the Senate of the Tariff Act.

Terms Used in Discussing Muscle Shoals

A Complete Glossary

Air Nitrates Corporation.—A subsidiary formed during the war for the purpose of making the cyanamid process of nitrogen fixation available to the United States. Nitrate Plant No. 2 was built by this corporation.

Alabama Power Company.—The principal electrical public utility corporation in Alabama. It is one of the subsidiaries of the Commonwealth & Southern Corporation. It owns a number of large developments for the production of steam power and water power at various points in Alabama. It is now the temporary lessee at Muscle Shoals.

American Cyanamid Company.—The licensees and operators of the cyanamid process of nitrogen fixation in North America. Their principal nitrogen plant is at Niagara Falls, Ont. They are the largest producers of phosphate rock in the United States. They have successfully manufactured concentrated nitrogenous fertilizers since 1917, and export about 250,000 tons of this product annually form their plant at Warners, N. J. (See Ammo-Phos.) This company now owns or controls forty subsidiaries and produces, in addition to fertilizer products, chemicals for metallurgical and fumigation purposes, pharmaceuticals, solvents, plastics, dyes and heavy chemicals.

Ammonium Nitrate.—A chemical compound (NH_4NO_3) similar to Chile saltpeter or sodium nitrate. This is the form in which nitrogen from the air is finally fixed at Nitrate Plant No. 2. It was intended to be used with TNT to produce the shell-bursting explosive known as amatol. It is used with ammonium sulphate in Ger-

many to produce ammonium sulphate-nitrate or leuna-saltpeter. It has certain physical characteristics which restrict its use as an unmixed fertilizer.

Ammo-Phos.—A trade name for a concentrated fertilizer product which is being exported in large quantity by the American Cyanamid Company. It is made in two grades, one containing 13% of ammonia and 48% phosphoric acid, and the other 20% ammonia and 20% phosphoric acid. Production has increased from 6,000 tons in 1923 to 64,000 tons in 1928 and 250,000 tons for 1930.

Ammo-Phos-Ko.—A new complete concentrated fertilizer which is being marketed by the American Cyanamid Company and which contains high concentration of all three plant foods (nitrogen, phosphoric acid and potash), and is to be produced, it is said, in several grades.

Chile Saltpeter.—Nitrate of soda ($NaNo_3$) mined from natural deposits in Chile. It is largely used in the fertilizer industry as a source of nitrogen in mixed fertilizers, and is used by farmers unmixed as a top dressing. In spite of competition by other forms of nitrogen, the production from the Chilean deposits was the largest last year (1929) in the history of these operations.

Cove Creek Dam.—A large navigation-power-flood control project planned to be built in the Clinch River about twenty miles northwest of Knoxville, Tenn. The project is to consist of a concrete storage dam 220 feet high to be provided with a barge lift for navigation purposes and an installation of hydroelectric equipment to produce 200,000 horsepower. This development would be chiefly useful as a means of partially regulating the flow of the Tennessee River so as to increase the continuous power available at all damsites below it in the Tennessee and Clinch Rivers. Estimated cost $37,541,642. Transmission distance from Muscle Shoals about 250 miles.

Cyanamid.—In connection with Muscle Shoals nitrate plant this term is used to designate calcium cyanamid, or lime nitrogen, a chemical compound of calcium carbide and nitrogen. This is the form in which nitrogen is first fixed in Nitrate Plant No. 2. Nitrogen in this form is easily converted into ammonia for producing other fertilizers, or into cyanides for metallurgical and fumigation purposes. It has a large number of derivatives, some of which are used in the plastic and pharmaceutical fields. Cyanamid forms a cheap source of nitrogen for use in mixed fertilizers, but its use in this way is limited by certain chemical characteristics.

Dam No. 2 (Wilson Dam).—A large navigation-power development in the Tennessee River at Muscle Shoals, Ala., 259 miles above the mouth of the river, consisting of a concrete dam about 4,500 feet long and 100 feet high, with locks providing for 9-foot navigation and a powerhouse equipped to produce 260,000 horsepower. The commercial primary or continuous power is about 80,000 horsepower and can be increased to about 150,000 horsepower by use of the Cove Creek storage dam. Dam completed in 1925; total cost about $47,000,000. Eight of the proposed eighteen hydroelectric units have been installed. Length of navigation pool, 16 miles.

Dam No. 3.—A proposed navigation-power dam about 6,700 feet long and 46 feet high, located 16 miles upstream from Dam No. 2 and 275 miles above the mouth of the Tennessee River. The power at this dam would be about 45% of the power at Dam No. 2, and the estimated cost of the development is about $45,000,000. It will provide a slack-water navigation pool 9 feet deep for a distance of 79 miles. Foundations have been investigated in a preliminary way, but no authorization for the construction of this dam has ever been made.

Florence, Ala.—The county seat of Lauderdale county; on the north bank of the Tennessee River near the lower end of Muscle Shoals.

Hale's Bar.—Thirty-five miles below Chattanooga, the site of a dam across the Tennessee River for power and navigating purposes. Completed in 1912 by private interests at a cost of about $11,000,000.

Haber Process.—A process of nitrogen fixation involving the direct union of nitrogen and hydrogen at high temperature and under great pressure. Much used a broad, but only recently perfected in this country. Nitrate Plant No. 1 was designed to use this process.

H. P.—Horsepower.

K. W.—Kilowatt.—For converting kilowatts into horsepower, the following formula is approximately correct; 3 kilowatts—4 horsepower.

Muscle Shoals Association.—A public association organized in 1916 by the people of Nashville, Chattanooga, Memphis, Birmingham, the Tri-cities and other cities and towns for the purpose of advocating the development of Muscle Shoals.

Muscle Shoals.—A stretch of swift rapids in the Tennessee River, some 37 miles long, extending west from Brown's Island west to Florence, Ala. The section covered by Dam No. 2 is the lower 16 miles of this stretch. The fall for this 16 miles is about 100 feet, the total fall in 37 miles being 134 feet.

Muscle Shoals Canal.—A navigation project begun in 1875 and partially completed in 1890, and abandoned under the present plan. The canal was built in two sections, one on the north bank of the river, 14½ miles long, and one, eight miles distant, on the south bank 5½ miles long. A third section was contemplated between these two, but was never built. Designed to provide a five-foot navigable channel; this was not wholly realized at most stages of the river. Canal is now partly submerged by the pool of Dam No. 2.

Muscle Shoals Hydro-electric Power Co.—A subsidiary company of the Alabama Power Company, which, in 1913, made an offer to the Government to develop Muscle Shoals. The offer was reported on favorably by the Corps of Engineers in March, 1916, but action on it was suspended because of the passage of the National Defense Act of that year.

National Defense Act.—An act passed by Congress on June 3, 1916, conferring on the President large powers to provide for national defense. Section 124 of this Act dealt specifically with the manufacture of nitrates for explosives and appropriated $20,000,000 for the purpose. It was under this Act that the Government took complete control of the Muscle Shoals waterpower project, the object being to use the power primarily for the manufacture of nitrates.

Nitrate.—Chemically, a nitrate is a salt formed when a given metal or base is reacted upon with nitric acid.

The nitrate which Nitrate Plant No. 2 was designed to produce is ammonium nitrate but the common form used in agriculture is sodium nitrate or nitrate of soda often called Chilean saltpeter. The word "nitrates" is frequently used in a vague or loose way to indicate the nitrogen-bearing products of a nitrate plant, such as ammonium sulphate, in which the nitrogen is present as "ammonia nitrogen," while in any nitrate the nitrogen is present as "nitrate nitrogen." The two forms of nitrogen have different characteristics and are differently used in agriculture.

Nitrate of Soda.—See Chile Saltpeter.

Nitrogen.—In the atmosphere, an invisible, inert gas uniting with other substances only at high temperatures. It is indispensable as a constituent of explosives and is one of the three forms of plant food in commercial fertilizers. To secure nitrogen from the air it must be "fixed" by some process such as the cyanamid or Haber process.

Nitrate Plant No. 1.—The first of two nitrate plants built by the Government. Constructed at a cost of $12,888,000; erected under an agreement with the General Chemical Company for the use of its process, the direct synthetic ammonia (Haber) process. Designed to produce 22,000 tons of ammonium nitrate (8,000 tons of pure nitrogen) per annum. Fixation plant was not a success, but the process has since been perfected elsewhere.

Nitrate Plant No. 2.—Second nitrate plant built by the Government. Constructed by the Air Nitrates Corporation of the American Cyanamid Company. Total cost, including steam plant and Waco Quarry, $67,555,000. Capacity 110,000 tons of ammonium nitrate (40,000 tons of pure nitrogen) per year. Utilizes cyanamid process of fixing nitrogen. Was constructed in one year, and was operated successfully during a test run of several weeks. First nitrate produced in November, 1918. Now in a stand-by condition. Practically obsolete as a cyanamid plant. Could be rebuilt to produce 50,000 tons of nitrogen annually at an estimated cost of $2,000,000. Both nitrate plants erected under supervision of Ordnance Corps, U. S. Army.

Phosphoric Acid.—One of the three forms of plant food in commercial fertilizers. The common form is ortho-phosphoric acid (H_3PO_4). It is obtained from phosphate rock by treating the rock with sulphuric acid. Pure phosphoric acid can be produced in the electric furnace by volatilization, the acid being recovered in liquid form in a Cottrell precipitator.

Potash.—Strictly speaking potash is the oxide of the metalloid potassium (K_2O). It is marketed in a number of forms, such as kainit, muriate (or chloride) of potash or sulphate of potash. It is one of the three essential elements of plant food and in its commercial forms it is frequently an ingredient of mixed fertilizers.

Primary Power.—Power which can be depended upon practically all the year round. The primary horsepower from the Wilson Dam, considered simply as a water-power proposition is about 80,000 horsepower available for 99 per cent of the time over a long period of years.

Riverton.—A town on the Colbert Shoals Canal, about 30 miles below Florence. The site of the only lock between Muscle Shoals and the mouth of the Tennessee River.

Sheffield, Ala.—The principal town in Colbert County on the south bank of the Tennessee River near the lower end of Muscle Shoals. Situated on the Southern Railway, adjoining Tuscumbia. On the outskirts of Sheffield are situated the Government reservations on which the nitrate and power plants are located.

Steam Plant at Nitrate Plant No. 2.—This plant, which cost about $12,000,000, is a thoroughly modern plant with steam turbines of 80,000 horsepower capacity. Particularly useful as a supplement to the Wilson Dam during low water, thereby increasing the primary power. It is designed to be increased to 120,000 horsepower by installing an additional unit.

Secondary Power.—As opposed to primary power, seasonal secondary power is available for a fraction of the year only. It is customary to speak of "ten-months secondary," "eight-months secondary," etc., to designate the fraction of the year during which such power is available.

Synthetic Process.—The processes for nitrogen fixation generally referred to as "synthetic" processes are those in which nitrogen is combined directly with hydrogen to form ammonia gas. The earliest of the processes is the Haber process (See Haber process above.) Other modifications are the so-called American process developed by the Fixed Nitrogen Research Laboratory of the Department of Agriculture, the Claude, the Casale and the Fauser processes. Nitrate Plant No. 1 is adapted to use the American synthetic process. This process uses a little less than one-half of the electrical power now required for the cyanamid process, except when the hydrogen is made by the electrolysis of water, in which case these synthetic processes require about 40% to 50% more power than the cyanamid process.

Tennessee River.—Sixth among the rivers of the United States. Its headwaters unite near Knoxville, and from there the river flows southwesterly into Alabama, then turns north, crosses Tennessee and Kentucky and flows into the Ohio at Paducah—a total length of 652 miles. The project officially recommended for its development calls for a 9-foot slackwater improvement from the mouth to Knoxville by means of navigation-power dams, or low dams for navigation only.

Tennessee River Improvement Association.—A public association of the people of the Tennessee Valley, organized in 1896 for the purpose of securing the improvement of the Tennessee River. Several associations for this purpose have been formed since 1828.

Tuscumbia, Ala.—The county seat of Colbert County, adjoining the town of Sheffield on the south.

Tri-Cities.—The towns of Florence, Sheffield, and Tuscumbia, lying in close proximity and with many common interests.

Waco Quarry.—A limestone quarry used to furnish limestone in connection with Nitrate Plant No. 2; situated 20 miles from Sheffield, 5 miles south of Russellville, Franklin County, Alamaba. Embraces an area of 460 acres, equipped with machinery having a crushing capacity of 2,000 tons of limestone per day. Cost, about $1,300,000.

Wilson Dam.—Same as Dam No. 2; called "Wilson Dam" in honor of President Wilson, who authorized its construction.

Present Status of Muscle Shoals

I. Physical Aspects of the Project

THE Tennessee River is formed by the confluence of the French Broad and Holston Rivers, 4½ miles above Knoxville, Tenn., flows southwesterly through the southern portion of Tennessee, westerly across the entire northern portion of Alabama, thence almost due north across the States of Tennessee and Kentucky and empties into the Ohio River at Paducah, Kentucky, 47 miles above the mouth of the Ohio at Cairo, Ill.

Total length ..... 652 miles
Total area drained.....40,570 square miles
Drainage area above Wilson Dam....30,514 square miles

Muscle Shoals Section of the Tennessee River

The portion of the Tennessee River, known as the Muscle Shoals section, extending from Browns Island to Florence, Alabama, a distance of 37 miles, with a vertical fall of 134 feet, and having a very swift current, exceeding 10 miles per hour, originally presented an impassable barrier to river navigation during low-water periods. To partially overcome this barrier to navigation the Muscle Shoals Canal on the right bank of the river, 14½ miles long, having a total lift of 85 feet with 9 locks, and the Elk River Shoals Canal on the left bank, 2½ miles long, having a total lift of 17 feet, were completed and placed in operation in 1890. These canals have been in continuous operation since that date, except when closed during the construction of Wilson Dam.

Plans for Development

The plan for developing the Tennessee River for navigation and power purposes includes three dams and locks in the Muscle Shoals section known as No. 1, No. 2 and No. 3.

Dam No. 1 with navigation lock extending from the north bank of the river to Patton's Island at a point .2 of a mile above the railroad bridge at Florence, Ala., was completed and placed in operation March 1, 1926. This dam provides a navigable channel of 9.5 feet depth on the north side of the island to the lower lock at Dam No. 2.

Dam No. 3, proposed as a navigation and power development, has not been authorized by Congress. The site is 16 miles above Dam No. 2, and provides for 84 miles of 9-foot navigable water above the dam. The estimated cost is about $38,000,000.

Provisions of the National Defense Act

Section 124 of the National Defense Act of June 3, 1916, reads in part as follows: "The President of the United States . . . is further authorized to construct, maintain, and operate, at or on any site or sites so designated, dams, locks, improvements to navigation, power houses, and other plants and equipment or other means than water power as in his judgment is the best and cheapest necessary or convenient for the generation of electrical or other power and for the production of nitrates or other products needed for munitions of war and useful in the manufacture of fertilizers and other useful products."

Under the provisions of this act, President Wilson by letter of February 3, 1918, authorized the construction of Dam No. 2, later named Wilson Dam.

The Wilson Dam

This project now completed (except for future power plant installation) is located 2.7 miles above the railroad bridge at Florence, Ala., and includes a dam, two navigation locks and a power house. The pool formed by the dam submerges Muscle Shoals Canal, locks Nos. 3 to 9, inclusive, and provides 14.7 miles of navigable water having a depth of not less than 9.5 feet at extreme low water.

The fundamental idea in constructing Wilson Dam by the Federal Government was to provide adequate hydroelectric power for the production of ammonium nitrate, used in making explosives, so that in case of prolonged warfare the supply of coal could be conserved. With the signing of the armistice, the nitrate plants in the vicinity of Muscle Shoals were closed, but Congress authorized the completion of Wilson Dam as an economic measure, and as a safeguard for the national defense.

In the summer of 1925, the installation of the first generating unit was completed and tests begun. In order to provide load for testing the generators, an agreement was made between the Chief of Engineers and the Alabama Power Company, whereby the latter would install the necessary transformers and would absorb in their distribution system the power generated during the testing period and would pay for the power thus consumed at a rate of 2 mills per kilowatt hour. On September 12, 1925, the first power was generated. After the testing period was over, the Government continued to furnish power and a new agreement was drawn. This agreement has been revised from time to time.

II. How Muscle Shoals is Operated Today

AT present the power from Muscle Shoals is distributed by the Alabama Power Company under a lease from the War Department, the principal terms of which are set forth in a letter from that company to the Engineer Corps, under date of January 4, 1930, as follows:

"It (the Alabama Power Company) will agree that during the calendar year 1930 it will take in the aggregate sufficient power at the rates specified in the above letter to amount to at least $560,000, providing the agreement is not canceled by the Secretary of War during the year 1930. If at midnight December 31, 1930, the amount of power taken during the calendar year 1930 does not amount in the aggregate to $560,000, the company agrees that the payment due for the month of December, 1930, shall be for an amount which added to the total amount due and paid for power taken during the calendar year 1930 will make an aggregate payment for that year of $560,000.

"If Congress takes such action concerning the properties at Muscle Shoals which in the opinion of the Secretary of War makes it necessary or desirable to cancel this agreement during the calendar year 1930, it may be canceled by him by letter addressed to the Alabama Power Company at Birmingham, Alabama. If so canceled, the company shall be relieved of the guarantee of $560,000 payment for the year 1930, and the payments shall be for power taken at the rates specified, during those months of 1930 in which this agreement is in effect, except that if such payments do not exceed the operating and maintenance expenses, the company will make a further payment so that the total payments made shall equal the operating and maintenance expenses, but not to exceed $16,000 per month or fraction thereof for the expired period.

"In order to increase the capacity for delivering power from Wilson Dam to other public utility companies under this contract, the company shall be given permission to make at its own expense a connection to the high tension substation at Wilson Dam for the delivery of power to the transmission line of the Southern Tennessee Power Company, the details of this connection to be as approved by the Chief of Engineers."

The rates and amount of power referred to in the letter are as follows:

"The power from Wilson Dam will be sold to the Alabama Power Company at the following rates:

(a) Power substituted for Gorgas Steam Power—2 mills per k.w.h.

(b) Power substituted for Gadsden steam power—3 mills per k.w.h.

(c) Power substituted for Nitrate Plant No. 2 power—4 mills per k.w.h.

(d) Power transmitted or relayed to other Public Utility Power Companies—2 mills per k.w.h.

The determination of the amount of power furnished under the different rates shall be made as follows:

(a) The total system generation for the day shall be plotted by the District Engineer from statement furnished by the power company.

(b) The Alabama Power Company hydro-generation shall be plotted to the top of the diagram.

(c) The Wilson Dam generation shall be plotted immediately under the Alabama Power Company's hydro-generation.

(d) So much of the Wilson Dam diagram as lies above 140,000 k.w. shall be paid for at the rate for Nitrate Plant No. 2, viz., 4 mills per kilowatt hour.

So much of the Wilson Dam diagram as lies between 130,000 and 140,000 k.w. shall be paid for at the rate for the Gadsden steam plant, viz., 3 mills per kilowatt hour.

And so much of the Wilson Dam diagram as lies below 130,000 k.w. shall be paid for at the rate for the Gorgas steam plant, viz., 2 mills per kilowatt hour.

Provided, however, that power transmitted or relayed to other public utility power companies by the Alabama Power Company shall be plotted at the top of the Wilson Dam diagram and shall be paid for at the rate of 2 mills per kilowatt hour instead of at the rate determined as hereinbefore specified."

III. What Muscle Shoals Has Cost the Government

THE physical development of Muscle Shoals to its present capacity has cost the Government, so far, a total of $127,355,450.16.

This represents the cost of the various war built plants and of the famous Wilson Dam, Dam No. 2, but does not represent various items of maintenance.

Following are the cost figures on the various units which go to make up the Muscle Shoals project as it stands today:

Nitrate Plant No. 1.....	$12,888,000.00
Nitrate Plant No. 2, including Steam Plant and Waco Quarry	67,555,355.00
Dam No. 2, (Wilson Dam)...	46,912,095.16
Total	$127,355,450.16

Extracts, see 6, *p.* 160.

Industrial Possibilities of Muscle Shoals

by W. G. WALDO

Former Supervisor, Muscle Shoals District Community Branch, Ordinance Department, U. S. Army; Technologist for President Coolidge's Muscle Shoals Inquiry Commission, 1925; Consulting Engineer and Secretary, Tennessee River Improvement Association.

FOURTEEN years have passed since Congress authorized the development at Muscle Shoals. Chemical engineering, meanwhile, has made vast strides, but Muscle Shoals still offers opportunities of national importance to both agriculture and national defense.

Its value to agriculture is that of a great demonstration plant showing how cheaply plant food can be supplied to the farmer in the form of improved fertilizers produced by modern methods and sold in such a way as to pass along the benefits to the consumer.

Such a demonstration plant would be no experiment in chemical engineerng. Nitrogen fixation and the production of concentrated fertilizers is well past that stage. The output would be large, for the plant capacity is equal to more than fifty per cent of our agricultural nitrogen imported from Chile in 1929. Expressed as Chilean nitrate it would amount to 335,000 tons annually.

The Nitrate Plants at Muscle Shoals

True, the nitrogen fixation portions of both nitrate plants are unsatisfactory. That at Nitrate Plant No. 1, designed to produce 8,000 tons of nitrogen annually by the direct synthetic process, was not successful but could be newly equipped to use this process at reasonable cost, and offers attractive possibilities as an experimental plant for synthetic nitrogen fixation.

Nitrate Plant No. 2 while not up to date as a cyanamid process plant could be rebuilt, according to reliable testimony, for about $2,000,000, to produce 50,000 tons of nitrogen per year.

The cyanamid process itself, while dependent upon cheap electrical power, together with coke and pure calcium limestone, has grown vigorously under American conditions at Niagara Falls. It is closely protected by patents while the synthetic process is available to anyone at nominal cost.

The Niagara Falls Cyanamid Plant

So it happens that only one American concern has had the opportunity of choosing between the cyanamid and synthetic processes. They have chosen to retain the cyanamid process and have doubled the capacity of their Niagara Falls plant six times in 20 years; it is now said to produce about 335,000 tons of cyanamid annually.

While the largest American market for cyanamid is as a cheap source of nitrogen in suitable form for "conditioning" mixed fertilizers, and over 100,000 tons are sold for this purpose annually, cyanamid is interesting at Muscle Shoals chiefly as a means of producing ammonia at low cost for use in the manufacture of more concentrated forms of fertilizer, such as AmmoPhos, containing as high as 61% of plant food in two of the three commercial forms.

AmmoPhos Manufacture

AmmoPhos is now being made at Warners, N. J., from cyanamid nitrogen in constantly increasing tonnage and is now said to be produced at the rate of 250,000 tons per year. With no tariff protection, this cyanamid nitrogen product competes successfully in world markets against both Chilean nitrate and synthetic nitrogen from Germany's government-subsidized, war-built plants. Surely it is no obsolete process that accomplishes such a result.

Reducing the Price of Concentrated Fertilizers

Concentrated fertilizers manufactured under a specified limitation of profit and sold directly to farmers through their own cooperative purchasing organizations, are the most effective means for distributing the benefits of Muscle Shoals over a wide territory. A report made by the Muscle Shoals Inquiry Commission, appointed by President Coolidge in 1925, showed that such products could furnish plant food to the farmers of the 23 principal fertilizer-using states at an average saving of 43 per cent below the delivered prices of the previous year, as reported by twelve hundred county agents.

Nitrogen prices are lower than in 1925, but the wide spread still remains between the possible 5 cents per pound or less for which nitrogen may be produced at Muscle Shoals, and the 20 cents per pound and more for which it is sold in fertilizer mixtures throughout the South and East.

Not Limited to Fertilizers

Muscle Shoals, however, should not be limited to fertilizer production alone. Cyanamid products are useful in many other ways. These include cyanide derivatives for spraying and fumigating citrus fruit trees; cyanides for the extraction of gold and silver from their ores; urea, useful not only as a highly concentrated nitrogen fertilizer but as the basis for the making of high-grade synthetic plastics employed in the manufacture of moulded goods for a multitude of purposes, and a list of other derivatives, some of which are useful in the production of pharmaceuticals and others for which new uses are being continually developed.

Cyanamid Derivatives

The late Senator E. F. Ladd, of North Dakota, who was a chemist of wide reputation, took a very keen interest in the Government's Muscle Shoals enterprise and presented an article in the *Saturday Evening Post* of November 29, 1924, in which he described some of the

interesting chemical possibilities of the Muscle Shoals situation. The Senator indicated that these products derived from cyanamid have ben studied in a limited way by the United States Fixed Nitrogen Research Laboratory, and include dicyanodiamide, melamine, guanylurea, guanidine and urethane. Among others which have received less attention he mentioned carbamic acid, amidodicyanic acid, carboxyguanidine, biguanide, ammeline, biuret, allophanic acid, cyanaminoformic acid and iminodicarboxylic acid.

Military Explosives

As Dr. F. G. Cottrell, Chief of the Fertilizer and Fixed Nitrogen Investigation, U. S. Department of Agriculture, has stated in an annual report: "Some of the large number of cyanamide derivatives have already found distinct uses in the manufacture of military explosives, in medicine and in the arts. This class of compounds forms the natural starting point for a whole new field in chemistry much as certain coal-tar compounds lay at the base of the present dyestuff industry."

Uses of Acetylene

In describing Nitrate Plant No. 2 as "the greatest calcium carbide plant in the world," Senator Ladd referred to a series of calcium carbide products which are the derivatives of acetylene, the gas which is formed when calcium carbide is treated with water.

"Acetylene," said Senator Ladd, "is most generally used for illumination, and in connection with oxygen produces, in a special torch, a very hot flame useful for cutting and welding steel and other metals. Combined with water, acetylene forms acetaldehyde, which, when oxidized, becomes acetic acid, which was used in a large way during the war for the preparation of materials for smokeless powder and dope for airplane wings. Acetic acid, however, when heated in the presence of a catalyst is converted to acetone, a valuable solvent especially useful in the making of smokeless powder, celluloid, chloroform, iodoform, sulphonal and many other organic compounds. Acetone is the base used to produce bromoacetone, which was used by the Germans as a tear gas. Its uses in organic synthesis defy enumeration. To mention one interesting example, when acetone is reduced by nascent hydrogen generated by the action of an amalgam of sodium on water, a dihydroxyalcohol is formed, called pinacol. This was made by the Germans in large quantities during the war and converted by heat and pressure into dimethylbutadiene, which, when merely stored in a sealed vessel, maintained at a temperature of about 60° Centigrade for about two months, was converted by a process called polymerization into synthetic India rubber.

Muscle Shoals and National Defense

The value of Muscle Shoals to national defense has been indicated by army officers who have testified that Nitrate Plant No. 2 alone can supply the explosive ingredient, ammonium nitrate, sufficient for the needs of an army of a million men. Its value to national defense, however, does not stop there. Senator Ladd in his article called attention to the opportunity for producing light metals for aircraft construction and gases for chemical warfare. The Senator particularly mentioned aluminum and magnesium, and such war gases as chlorine, mustard gas and tear gas, together with other chemical products for use in the manufacture of textiles, paper, solvents and plastics.

Terro Alloys

As an indication of what cheap power and suitable raw materials can do in the electric furnace, certain products of these industries, many of which are absolutely indispensable in modern warfare, are of interest.

These are the ferro-alloys which are used chiefly in the manufacture of steel and consist of compounds of iron with certain metals, such as silicon, chromium, manganese, vanadium and molybdenum. It is these ferro-alloys which make possible the production of special steels for projectiles, guns, armor plate and cutlery. These same alloys make it possible to speed up the output of machine shops by operating lathes and other machine tools at high speed through the use of tool steels which will hold their edge when very hot. It is these alloys which give to steel the strength, toughness and resistance to shock that is necessary in certain automobile parts to which we frequently trust our lives.

Electric Furnace Products

Another electric furnace product for which Muscle Shoals is specially adapted is calcium carbide, and its immediate derivative, acetylene gas, necessary in the oxy-acetylene process of welding and cutting metals, and as a gas for lighting and cooking. The interests producing these war-time necessities include chemical companies producing solvents, intermediates, pharmaceuticals and other chemical products which are in demand for the manufacture of explosives, flavoring extracts and many other purposes.

Should Not Be Abandoned

How many of these operations would be carried on at Muscle Shoals under a private lease to the electrochemical and electrometallurgical industry, no one can say, but it would undoubtedly become the center of some of the most important operations of this kind in the United States. If operated by the Government merely as an experimental nitrate plant its value to Alabama, to the South, and to the country at large would become insignificant.

As for abandoning the industrial operations at Muscle Shoals and leaving the dam to become a single unit in an interconnected network of electrical systems, this policy would rob the Alabama development of its last vestige of national interest. Muscle Shoals kilowatts widely distributed over long distances would lose both their identity and their economy. In some instances such a use would merely delay the development of other water-powers which would otherwise be undertaken.

What Muscle Shoals Means to the Farmer

by CHESTER H. GRAY
Washington Representative of the American Farm Bureau Federation

THE full-time capacity production of highly concentrated fertilizers at Muscle Shoals, using the power available in the making of fertilizers and distributing only such power as is found not to be needful to produce fertilizers, may be said to be a one sentence description of the agricultural point of view at Muscle Shoals.

Farmers are not interested in the much provoked controversy relative to which is the best process to fix nitrogen from the air. On the contrary farmers recognize that the establishment at Muscle Shoals was built to use the cyanamid process; the power is available for the use of that process; the capacity of the cyanamid process to meet world competition has been and is constantly being demonstrated; and the scrapping of the immense investment at Muscle Shoals, in order to go at the business of fixing nitrogen by some other process, does not look to be businesslike.

This does not mean to say that the process installed at Muscle Shoals is greatly superior to some other processes for fixing atmospheric nitrogen. Given the surroundings and conditions which are necessary to complete success it seems to be about an even race so far as reduction of fertilizer prices is concerned between the Haber-Bosch and the Cyanamid process.

Differences in Rival Processes

The former process does not require so much power as does the cyanamid process, but other factors of cost, such as the higher skill of labor required and the greater number of laborers per ton of production, increases its cost. On the other hand, the cyanamid process requires considerable power, although that factor has been materially lessened by recent developments; but it does not require per ton of production the labor expenditures which are necessarily assessed against some other processes. The Haber-Bosch process naturally needs to be located where its requirements most advantageously can be met. These requirements are cheap labor, plenty of coal, and closeness to natural resources necessary to the making of complete fertilizers. The cyanamid process naturally needs to be located where power is abundant and cheap, and where the natural resources necessary to the making of fertilizers are cheaply available.

The practical results to the American farmer from the operation of Muscle Shoals will be:—

1. A rapid development in the production of highly concentrated fertilizers, carrying, not 15 or 20 per cent of plant food, but from 40 to 60 per cent;

2. A material reduction in the price of fertilizers owing to the cheapness of manufacturing costs and the lessening of transportation costs; to the limitation of profits which is steadfastly required in all bills which farm organizations support; and to the oversight of all cost factors on the part of the Muscle Shoals Farmer Board provided for in such bills.

Ten Points to Be Covered in Policy

The major items in determining the policies which shall be maintained in regard to Muscle Shoals by agriculture are these:

1. Private operation on a full-time capacity basis by a lessee who is bound by a contract which cannot be violated except under severe penalties;

2. The unit operation of the project, which means that the power, nitrate plants, and all other appurtenances, shall be operated for the common purpose of making fertilizers instead of separating the project into two or three different undertakings;

3. The full capacity production is to be reached as soon as possible, dependent upon the use by farmers of the highly concentrated fertilizers to be made;

4. Fertilizers produced at Muscle Shoals to carry plant food of 40 per cent strength or more;

5. The ascertainment of and the supervision over all cost factors by a Farmer Board;

6. This Board is to be representative of and nominated by the three major farm organizations—the American Farm Bureau Federation, the National Grange, and the Farmers' Union;

7. The contract or lease to be for a fifty year period, subject to renewal on the part of the Federal Government to the first lessee, or any other bidder offering at that time better conditions;

8. The payments by amortization process of installments which will in time refund into the Federal treasury much of the cost of the Muscle Shoals project;

9. Perpetual title to the entire project, waterpower and all, is to remain perpetually in the Government, with provisions to terminate the lease on account of non-performance on the part of the lessee;

10. All of the above items of the agricultural program on Muscle Shoals will carry forward the four big factors which are contained in this subject—namely:—

(a) To keep the entire establishment in a state of preparedness in case of future war;

(b) To develop barge transportation on the Tennessee River from Knoxville or Chattanooga to the junction with the Ohio, thereby adding materially to the inland river system of our nation;

(c) The establishment of the principle of amortization in regard to great Federal expenditures so that the recipients of a benefit will in time repay the Federal Government for its original expenditure;

(d) The production of atmospheric nitrogen and its manufacturing into concentrated fertilizers for distribution to all parts of the country.

Provisions of the Norris Resolution

Senate Joint Resolution 49, introduced by Senator George W. Norris, Neb., R., was reported from the Senate Committee on Agriculture and Forestry May 29, 1929, and by agreement it was given a place on the calendar next to the Tariff Bill. Immediately following the passage of the Tariff Bill S. J. Res. was taken up and was passed by the Senate on April 4, 1930. When received in the House it was referred to the Committee on Military Affairs.

SENATE Joint Resolution 49 provides for the organization of a governmental corporation which shall be controlled by a board of directors consisting of three persons. The corporation shall be known as the "Muscle Shoals Corporation of the United States." Members of the board are to be appointed by the President by and with the advice and consent of the Senate. The term of office of members of the board is fixed at six years. It is required that members of the board shall be citizens of the United States and shall receive compensation at the rate of $50 per day for each day actually engaged in the performance of the duties vested in the board. It is provided that they shall receive pay for not exceeding 150 days for the first year after the approval of the act and not to exceed 100 days in each succeeding year. Their salaries and expenses are to be paid by the corporation out of the income from the sale of power. It is provided in the joint resolution that no director shall have any financial interest in any public utility corporation and shall not have any interest in any business that may be adversely affected by the success of the Muscle Shoals project. It is the duty of the President, in appointing the members of this board, to select men who have a belief in the feasibility and wisdom of the provisions of the joint resolution.

Organization of the Government Corporation

The general control and management of the corporation is vested in a general manager and he is held responsible to the board for the official conduct of the business. He is appointed for a term of 10 years, but is subject to removal by the board for cause. Provision is made for the appointment by the manager, with the consent of the board, of two assistant managers. One of the assistant managers shall be a man possessed of knowledge, training, and experience to render him competent and expert in the production of fixed nitrogen. The other assistant manager shall be a man trained and experienced in the production and distribution of hydro-electric power. The combined salaries of the general manager and the two assistant managers must not exceed the sum of $50,000 per annum, the exact salaries within this limitation to be fixed by the board.

Powers and Duties of the Board

The powers and duties of the corporation are such as are usually given to corporations of this kind. In a general way the corporation may purchase or lease and hold personal property, and there will be turned over to it by the Government the real property now owned by the Government at Muscle Shoals. The bill provides that the board may appoint all the necessary employees, etc., for the carrying out of the purpose of the corporation.

The board is directed to operate the existing plants now at Muscle Shoals for experimental purposes. The members are given authority to construct, maintain, and operate such plants at or near Muscle Shoals for the manufacture of fertilizer or any of the ingredients comprising fertilizer. They are given broad powers in the experimental field. They are directed to arrange with farmers and farm organizations for large-scale practical use of new forms of fertilizer which may be developed under such conditions and which will permit actual measurement of the economic return produced therefrom. It is their duty to cooperate with National, State, district or county experimental stations or demonstration farms, for the use of new forms of fertilizer or fertilizer practices.

They are directed to manufacture fixed nitrogen at Muscle Shoals by the employment of existing facilities or such other process or processes as the board may deem wise and profitable. They are authorized to modernize existing plants. They are authorized to donate not exceeding 1 per cent of the total product of the plant or plants operated by the corporation and to distribute the same fairly and equitably through the agency of county demonstration agents, agricultural colleges, or otherwise as the board may direct for experimentation, education, and introduction of the use of such products in cooperation with practical farmers so as to obtain information as to the value, effect, and best methods of use of the same.

Experiments in Nitrogen Products

They are authorized to maintain and operate laboratories and experimental plants and to undertake experiments for the purpose of enabling the corporation to furnish nitrogen products for military and agricultural purposes in the most economical manner and at the highest standard of efficiency.

They are also authorized to secure assistance and advice from any officer, agent, or employee of any executive department or of any independent office of the United States in order to enable the corporation to better carry out its powers; and the President is authorized to direct that such assistance, advice, and service shall be rendered to the corporation.

The Secretary of War and the Secretary of the Navy are authorized to requisition the board for the manufacture of explosives at cost. They are directed to supply, without cost, to the War Department all the power necessary to operate the locks on the Tennessee River. All surplus power not used for the purposes herein described the board is directed to sell. They are directed to keep accurate books of account and provision is made for annual reports and for the audit and examination of their accounts. These reports must be made both to the President and to the Congress annually.—*Extracts, see 1, p. 160.*

The resolution declares it to be the policy of the Government to distribute the surplus power equitably among States within transmission distance; and in order to give the board a fair basis for making contracts and for receiving bids for the sale of power it is authorized, either from appropriations made by Congress or from funds secured from the sale of power, to construct, lease, or authorize the construction of transmission lines within transmission distance.

Preferences in Sale of Power

In the sale of power preference shall be given to States, counties, municipalities, and other public or cooperative organization of citizens or farmers not organized for profit, but doing business for the purpose of supplying electricity to its own members. It is provided that when any such State, county, municipality, or cooperative organization of citizens or farmers, or any two or more of such municipalities or organizations shall construct or agree to construct transmission line or lines to Muscle Shoals, the board is directed to contract with any such State, county, municipality, or other organization, or any two or more of them for the sale of electricity for a term not exceeding 15 years. Any surplus power not so sold to any of the above-named organizations can be sold to any person or corporation engaged in the distribution and resale of electricity for profit, but in such sale the board shall require that such person or corporation agree that any resale of such electric power by such person or corporation shall be sold to the ultimate consume at a price which shall not exceed an amount fixed as reasonable, just, and fair by the Federal Power Commission. It is provided that the Government shall complete the steam plant at Muscle Shoals by installing additional machinery and also by installing additional machinery at Dam No. 2, and likewise shall build and construct Cove Creek Dam. When this dam is constructed it shall be turned over to the corporation for control and management the same as the other properties located at Muscle Shoals in Alabama.

Distribution of Proceeds to Alabama and Tennessee

Section 12 of the joint resolution provides that 5 per cent of the gross proceeds received by the board for the sale of power generated at Dam No. 2, or from the steam plant located in that vicinity, or from any other steam plant hereafter constructed in the State of Alabama, shall be paid to the State of Alabama, and 5 per cent of the gross proceeds from the sale of power generated at Cove Creek Dam shall be paid to the State of Tennessee. Upon the completion of Cove Creek Dam the board shall ascertain how much excess power is thereby generated at Dam No. 2 and from the gross proceeds of the sale of such excess power 2½ per cent shall be paid to the State of Alabama and 2½ per cent to the State of Tennessee. The object of this provision is to compensate the States of Alabama and Tennessee for any loss in the way of taxes which such State might suffer by reason of the Federal Government owning and operating these properties, which might otherwise be owned and operated by private corporations. The rates of payment are, of course, tentative; but it is believed the amounts are fair, just, and equitable.

It will be conceded that for any strictly governmental purpose the Federal Government should not pay taxes to the States where any of its property is located, but in case the Government in carrying out governmental functions produces a surplus commodity that it does not use and sells such commodity upon the market, it does, perhaps, prevent such manufacture and sale from being done by private parties, who would pay taxes to the State upon the property so used.

Disposition of Surplus Power

This surplus power which the board will so dispose of is only an incident to carrying out the proper and desnigated governmental functions brought about by the Government in its manufacture of explosives for war purposes, in the fertilizer field, in its activity in regard to flood control, and in its improvement of the navigability of our streams. It would not be proper for the States, even if they had the power, to levy taxes upon the entire investment of the property because this investment is necessary in carrying on proper governmental functions. It is impossible, of course, to accurtely divide this investment and to say how much of it is utilized in flood control, in improving the navigability of the Tennessee River, in the manufacture of explosive for war purposes and in the experimentation and development of fertilizer ingredients, or how much of it is utilized in the production of surplus power thus produced. An investigation of the taxes paid by private corporations engaged in the generation and distribution of electric power discloses a wide variance as to what per cent of their gross income is paid in the shape of taxes. The figures vary all the way from a little over 2 per cent to as high, and sometimes higher than, 8 per cent. Under the circumstances, the percentages provided for to be paid to the States of Alabama and Tennessee in lieu of taxes is quite liberal.

In ascertaining the gross proceeds from the sale of power upon which a percentage is paid to the States of Alabama and Tennessee, the board shall not take into consideration the proceeds of any power sold to the Government of the United States, or any department of the Government of the United States used in the operation of any locks in the Tennessee River, or for any experimental purpose, or for the manufacture of fertilizer of any of the ingredients thereof, or for any other governmental purpose.

The net proceeds derived by the board from the sale of power and from the sale of any products manufactured by the corporation, after deducting the cost of operation, maintenance, depreciation, and an amount deemed by the board as necessary to withhold as operating capital, shall be paid into the Treasury of the United States at the end of each calendar year.

Reservation is contained in the joint resolution for the Government of the United States, in case of war or national emergency, to take possession of all or any part of the property referred to in the act for the purpose of manufacturing explosives or for other war purposes. But if this right is exercised by the Government, the Government shall pay the reasonable and fair damage which may be suffered by any party whose contract for the purchase of electric power or fixed nitrogen or its ingredients is thereby violated.

Section 20 provides that in order that the board may not be delayed in carrying out the program authorized in the resolution the sum of $10,000,000 is authorized to be appropriated from the Treasury of the United States.

Provisions of the House Resolution

The Norris Resolution was referred to the House Committee on Military Affairs on April 8. A subcommittee appointed to consider the Norris Resolution and the pending House bills reported on May 1 and the full committee accepted its report on May 2. Since, the title and Senate number of the Norris Resolution is retained, the resolution, if adopted by the House, may be adopted by the Senate, as amended, without its having to go to conference. The members of the subcommittee which wrote the House resolution were Representatives B. C. Reece, Tenn., R., chairman, T. C. Cochran, Pa., R., Percy E. Quinn, Miss., D., L. W. Douglas, Ariz., D., and J. J. McSwain, S. C., D.

UNDER the provisions of the joint resolution as agreed upon by the House Committee on Military Affairs, all of the Norris Resolution, S. J. Res. 49, is stricken out except the number and the enacting clause, and in place of the Norris plan of Government operation there is substituted a proposal whereby a Government Board would be created and empowered to negotiate a lease for the operation of Muscle Shoals.

The Board is to be composed of three citizens, one of whom is to be identified with agriculture, all to be appointed by the President.

Value of Muscle Shoals to Be Appraised

The Board would be required to appoint appraisers to appraise the present fair value of the Muscle Shoals development. Any lease negotiated by the Board must be approved by at least two of its members and also by the President. When the Board has negotiated the lease it notifies the President, who is required to indicate his approval or disapproval within thirty to sixty days. If the President disapproves of the first lease, the Board can reopen negotiations and submit further leases to him.

In negotiating such a lease the Board is required to conform to the following specifications set forth in the resolution:—

(1) A tenure of not to exceed fifty years;

(2) The Muscle Shoals development to be "devoted to the fixation of nitrogen in the manufacture of fertilizer bases or fertilizers in time of peace for use in agriculture, and of explosives or the essential ingredients thereof in times of war";

3. A guarantee of the annual production of a specified amount of "nitrogenous plant food of a kind and quality and in a form available as plant food and capable of being applied directly to the soil in connection with the growth of crops; and a guaranteed production of fertilizer bases or fertilizer containing not less than 10,000 tons of fixed nitrogen during the first three years from the effective date of the lease;

Production Must Be Guaranteed

4. A guarantee of periodic increase in the production of fixed nitrogen as market demands require until the maximum production capacity of the plants is reached. The lease would not require any increase in production whenever the market demands are satisfied by the maintenance in storage and unsold of fertilizer bases or fertilizers containing at least 2,500 tons of fixed nitrogen;

5. Such fertilizer bases or fertilizers are to be sold at cost plus a profit of 8%. This cost is to be determined by a firm of certified public accountants appointed by the President and another appointed by the lessee, and in the event of their disagreement a third firm selected by these two firms shall hear the contentions and decide the issues;

6. If the lessee suspends temporarily the production of fertilizers, credit against the cost of producing fertilizers must be allowed in the amount of 50 per cent of any profits made on the sale of electric power made possible by such suspension;

7. In the sale of fertilizers the lessee must seek the widest distribution consistent with demand, and give preference in its sales first to farmers and their cooperative associations, and second, to state agencies engaged in processing and mixing fertilizers for resale to farmers. When these demands are supplied, sales may then be made to fertilizer manufacturers, mixers or merchants;

Cove Creek Dam and Dam No. 3

8. The lessee must provide for the development of electric, chemical, ferro-alloy and other industries in addition to fertilizers;

9. The construction of the Cove Creek Dam and of Dam No. 3, so as to produce the maximum primary power at Dam No. 2, to improve navigation on the Tennessee River, and to increase the facilities of flood control. These dams will be constructed by a holding corporation or otherwise through the issuance of a license by the President, subject to the provisions of the Federal Water Power Act of 1920. If the cost is found to be in excess of a reasonable cost for power purposes, the Government may be obligated to reimburse the licensee in whatever amount is deemed by the Board as a necessary contribution to the cost on account of navigation improvement, the Government to reimburse the licensee out of the proceeds from the lease of the hydro-power plant at Dam No. 2;

10. The lease must provide for the annual payment to the United States for the term of the lease a sum which at 4% interest compounded over a fifty-year period will equal the appraised value of the properties;

11. The lessee must pay a fair rental for the use of the properties;

12. Surplus electric power generated at Muscle Shoals must be equitably distributed among the states within economic transmission distances;

13. Surplus electric power may be sold to private power distributing companies only for a period of not to exceed seven years; but no power can be sold to them until first the demands of states, counties, municipalities, and other political subdivisions, and of manufacturing industries have been satisfied, and then only for periods of not to exceed seven years;

14. Nitrate Plants Nos. 1 and 2 are to be kept in an up-to-date condition ready for the use of the War Department in the event of a national emergency;

Recapture of the Properties Provided For

15. Right of recapture of the properties by the Gov-

Continued on page 160

Should Uncle Sam Operate Muscle Shoals?

Pro

HON. GEORGE W. NORRIS,
U. S. Senator, Neb., R.

THE question involved in the consideration of Muscle Shoals is not whether we favor Government or private operation. The Government now owns the property at Muscle Shoals. There has been expended in this investment in the neighborhood of $150,000,000 of public money. This has been done in behalf of national defense and in behalf of methods to bring about improvements in agriculture.

The question is not whether the Government shall acquire the property at Muscle Shoals but rather whether it shall retain what it has already acquired through taxation; whether it shall continue, as the original act provided it should, to operate Muscle Shoals in behalf of the people and whether it shall utilize that property to its fullest advantage in the development and the cheapening of fertilizer. These are Governmental functions. Everybody admits they are, and the present resolution has no other object than the proper handling of Governmental property; the proper and fair continuance of Governmental functions; and the preservation of property already owned by the Government of the United States.

It is not a question of putting the Government into business, but it is a question of protecting Government property, the improvement of navigation, and the controlling of damaging flood waters. All these are governmental functions. The improvement of our national defense, the preservation of the fertility of our soil, the control of our navigable streams, and the protection of our people from the damaging destruction of flood waters are the primary reasons why this resolution should be passed.

Why should we hesitate to take these necessary steps? If in carrying them out we incidentally produce more power than the Government can utilize, it ought to be a subject for congratulation if, in performing these governmental functions, we can as an incident thereto, develop both cheap water power and cheap electricity and give them to the people at prices that will demonstrate the possibilities of the proper uses of our flowing streams. If, in carrying on these proper governmental functions, we incidentally lighten the burdens of the home and cheapen the necessary and essential elements in manufacturing, we should rejoice rather than despair. And yet, the opposition which has been so powerful and which has prevented the passage of proper legislation regarding the Government's property at Muscle Shoals is moved entirely by the selfish financial interest that great combinations of wealth can bring to themselves if they are permitted to capitalize the power of our flowing streams.

If, in the manufacture of explosives for our Army and Navy; in the cheapening of fertilizer for our farms; in the improvement of the navigability of our streams; in the protection of our people from the damage of flood

Continued on next page.

Con

HON. SIMEON D. FESS,
U. S. Senator, Ohio, Republican

I HAVE had before me, ever since I entered Congress more than 17 years ago, the question of Muscle Shoals. It had been before Congress for 10 years prior to the time I entered the House. The first speech I ever heard made by the distinguished Oscar Underwood, of Alabama, then the leader of the House, was on the question of Muscle Shoals. The last speech I heard by that distinguished gentleman, who had become a Senator, was on the subject of Muscle Shoals.

Every year the matter was before us so that it is not a matter of ignorance on the part of the public. When Mr. Underwood asked back in 1913 for an appropriation, all he asked for was $10,000,000. It was voted down, with very little support for it. Then, when the war came on, that item having been up every year in the meantime, it was put under the phase of an emergency for the creation of a nitrate plant, and under the stress of war I naturally, without any hesitation, voted for the authorization of $20,000,000. In the authorization the nitrate plant was not located. In fact, the authorization permitted more than one plant. Soon after the location of the nitrate plant at Muscle Shoals we were called upon to give unregulated authority to the President in the expenditure of an additional $100,000,000. I voted for it without hesitation because we were in the midst of war and anything that the Commander in Chief of the Army would ask at such a time would be given him, I think, without very much hesitation—none so far as I am concerned.

The matter has gone on, one step after another, until the initial authorization of $20,000,000 has now reached $125,500,000. Under Senate Joint Resolution 49, which is similar to the one on which I voted a year ago, there is an additional $52,000,000 more to be expended before it is supposed to be completed. That is an enormous amount of public expenditure. Our problem today is, What are we going to do with the Muscle Shoals property? We have it on our hands. The Government owns it. Shall we junk it? I would not think so. There are people who think we would better do so; but I do not think the people who so urge have thought through the possibilities of the matter.

The other plan that might be open to consideration would be for the Government to sell the property outright and pass title to it, if it could find a purchaser. In the first place, there might be difficulty in finding a purchaser so that the consideration might be very small, if not wasteful.

Then there is another opposition to the sale of the property, and that is because of the tremendous possibilities which are involved in the future development of hydro-electric power. It would appear that it would be wiser for us not to dispose of the property in fee simple unless we could do it for a very reasonable consideration. I think we might as well pass that over.

Continued on next page.

Pro

HON. GEORGE W. NORRIS—*Continued*

waters, we incidentally give other benefits to hundreds of thousands of our citizens should we hesitate to go forward simply because, in these incidental benefits, we are preventing private monopoly from gouging the people of the country in the charging of exorbitant rates for electricity?

The passage of this resolution is only a business proposition. It ought to have the unanimous support of all those who believe in the preservation of our natural resources and the prevention of their exploitation by private monopoly for private gain.

Muscle Shoals had its inception when a patriotic people, fearful that our Government might become involved in a world war struggle, through its Congress, authorized the President of the United States to establish plants for the production of war explosives. It was a patriotic movement to make our country independent of the balance of the world in the production of nitrogen for production of ammunition. The World War had demonstrated that modern warfare demanded the production of explosives in quantities theretofore unknown.

One of the necessary elements was more and more nitrogen. We were dependent to a great extent for our nitrogen upon imports from beyond our borders, and yet an unlimited supply of nitrogen was contained in the atmosphere. The problem was to get from the atmosphere this necessary ingredient.

Up to that time but two methods were known to the world. The older of these processes was what was known scientific world of extracting nitrogen from the atmosas as the arc process. Another process then well understood was an improvement over the arc process known as the cyanamid process. Both of these processes required a vast amount of power, and President Wilson selected Muscle Shoals in Alabama, where it was decided to locate a plant larger than any then known to extract nitrogen from the atmosphere to be used as national defense in supplying our Army and Navy with explosives. It was known at that time that Germany had developed a cheaper method of extracting nitrogen from the air by what was known as the Haber process, but our chemists and scientific men were not fully conversant with this more modern process and were not certain that they understood sufficiently well the intricacies of the process to guarantee the erection of a plant that would bring about production under that process, so it was decided to build nitrate plant No. 1, designed to extract nitrogen from the air by what was known as the Haber process.

The operation of nitrate plant No. 2, while not requiring as much power as the more ancient arc process, nevertheless requires a vast amount of power. After the war was over our chemists were enabled to study more fully the Haber process used by the Germans, and the scientific world now recognizes that for more practical purposes the Haber process has superseded the cyanamid process. It has itself been greatly improved, simplified and cheapened and, in the modified and improved form, it is the one most universally used throughout the civilized world. In its modifications and changes it has become commonly known as the synthetic process. Very large plants have been established in different countries, quite a number of them in our own country, by private corporations. Changes are continually being made. Im-

Continued on next page.

Con

HON. SIMEON D. FESS—*Continued*

There was an effort once made to sell it to Henry Ford. I did not think at the time that the consideration was a good one. I did not give my support to the proposal, although the pressure was something tremendous.

The two alternatives left would be for the Government, owning it, to lease it under proper terms and acceptable consideration, or to operate it as a Government project. There are the two alternatives. I think we are limited to one or the other. Every time the matter has come up for final decision I have opposed Government operation of the property. I have been convinced that it would be much better for us to secure a lease under satisfactory conditions, so that not only would we be safeguarding the rights of the public but also we would have a recanture clause, so that the property would ultimately be back in the hands of the Government, either to re-lease it, or for whatever operation we might at that time decide upon, and not make Muscle Shoals a different or an exceptional case from the general waterpower project. That is the position I have taken from the beginning, and my reasons are clear to myself.

When the vote was taken on the bill which preceded this one, which was identical with this one except in some minor details, the bill failed of final passage by virtue of the veto of the President. It passed the Senate but not with my vote.

When the matter came up as presented by the distinguished Senator Underwood, I voted with him because he had proposed the leasing of the project. Now I want to look into and discuss what the present proposal contemplates.

In the first place, it creates an independent board, subject to no one. It would appear to me, if the measure is a national defense act or a flood control act, that the final power ought to be lodged in the Government through the Secretary of War. The suggestion of creating a board with the powers this board will have, subject to no one, is a serious proposal, and ought to be looked into carefully before we go that far.

The first time the bill was presented it was a proposal to make nitrates for explosives, and that being a Government function, I voted for it. The second time it was presented the nitrates feature had been expanded to include fertilizer for the farmer—not only the explosive feature as a matter of national defense, but fertilizer as an agricultural relief measure for our farmers. Now the proposal has been broadened to include navigation and flood control—the same bill exactly, but with its purposes changed.

Of course, flood control is a Government function, and no one would hesitate on that score. When the Boulder Dam matter came up primarily for flood control I did not hesitate to give my support to it. When it was designated that as a by-product out of that great construction power would be developed and that the Government would probably, in control of the dam, be producing power, I did not hesitate to vote for the project, when the power feature was secondary while the primary feature was Government function in flood control. Even though out of that project we have irrigation, that also will be secondary. I would not hesitate at all, as I did not in the matter of the Mississippi River flood control, to vote for any measure justified on that basis.

Continued on next page.

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HON. GEORGE W. NORRIS—*Continued*

provements in the process are rapidly taking place. In all these changes and in all these improvements less and less power is used, so that at the present day power is a secondary consideration in the establishment of a modern process for the extraction of nitrogen from the atmosphere. The most important element in a nitrogen plant is a cheap coal, a coal from which coke can be economically produced, and about the only necessity for power in connection with such a plant is its use in the operation of the necessary machinery.

We find, therefore, that the location of a nitrate plant at Muscle Shoals was based upon what was then believed to be the greatest asset—cheap power. There is no doubt but that at the time the Govenrment built this great nitrate plant cheap power was the most important element to take into consideration. If, however, we were at the beginning and were hunting a location for a nitrate plant, it would not be located at Muscle Shoals. Power would not be taken into consideration. The chief thing to be sought would be cheap coke. No one, however, favors the abandonment of our great enterprise at Muscle Shoals. Every one realizes that after the expenditure of the vast amount of Government funds it would be unwise to seek a new location and abandon our enterprise.

One reason why this is so is because nitrogen has a peace value as well as a war value. Nitrogen is one of the chief elements of fertilizer, and the importance of fertilizer is growing every year. Every student of the subject knows that the perpetuity of our Government, in fact, of the civilized world, unless some new unknown thing is invented and developed, depends upon fertilizer which is a necessary and important thing in which all classes of people, the producer and the consumer, are vitally interested. More and more fertilizer will be used, and more and more fertilizer should be used in order to preserve the fertility of our soil and guarantee a future production of food products sufficient to satisfy the needs of our growing population.

It is fair to say that Muscle Shoals, while originally established as a matter of national defense, has become more important as a fertilizer proposition. In fact, when the original act was passed it was known that the extraction of nitrogen from the atmosphere was as important to agriculture in time of peace as it was in the production of explosives in time of war. It has, therefore, a peace value of perhaps more importance to the prosperity of our country than its wartime value. Muscle Shoals, therefore, can be compared to a great battleship, but it is worth much more than a fleet of battleships because armed vessels are of no value in time of peace, but this great battleship is as valuable in time of peace as during war.

While great improvement has been made in the extraction of nitrogen from the atmosphere since we started our work at Muscle Shoals, yet it is well understood by the scientific world that there is much still to be desired, and scientists everywhere believe there will be much more yet accomplished in the way of cheapening the production of fertilizer and its application to the soil. The cheapening of the process, the mixture, and the application to the soil of fertilizer are recognized everywhere as proper governmental activities. The expenditure of governmental funds for the cheapening of fertilizer and

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Con

HON. SIMEON D. FESS—*Continued*

But here we have what once was a matter of explosives for national defense, and next in addition to that agricultural relief in the production of fertilizer, and now expanded to include flood control. It is a question with me whether flood control is not included for the sake of justifying it as a Government function.

There is another provision of the resolution to which I would like to call attention, the wording of which is interesting:

"All members of the board shall be persons that profess a belief in the feasibility and wisdom, having in view the national defense and the encouragement of interstate commerce, of producing fixed nitrogen under this act of such kinds and at such prices as to induce the reasonable expectation that the farmers will buy said products, and that by reason thereof the corporation may be a self-sustaining and continuing success."

That is propaganda; that is incorporating a speech in this measure; that is a plea for the support of the farmers of the country. No one can become a member of this board who does not believe in Government operation and Government control of industries. What would be the reaction of this body if in the creation of the Tariff Commission we should write as a qualification of membership that nobody who believes in a protective tariff shall be eligible or that nobody who does not believe in a protective tariff shall be eligible; that the judgment of all appointees to the commission must be predetermined and well known? For the board to be created by this joint resolution it is not desired that its members should be open minded, able to look into the problem and decide upon the facts of the case and reach an impartial judgment; but those are desired who are prejudged in the interest of Government ownership, otherwise they are not eligible to go on the board. That is the most extraordinary and curious qualification that I have ever seen written into a proposed statute providing for the creation of a governmental board.

There is no fixed limit on what the board may expend. The amount is left to its own judgment; the board does not need to come back here to ask for an authorization for the expenditure of hundreds of millions of dollars; but, if it sees fit to do so, it may go ahead and build such structures and spend such amounts of money as it may deem wise. It is not beholden to the Congress nor to the President nor to the Secretary of War, but is a law unto itself. Blanket authority is given by this joint resolution when it provides:

"That all appropriations necessary to carry out the provisions of this act are hereby authorized."

When we shall pass this act the board will have unlimited authority for the expenditure of money. The only thing we could do would be when the board appeared before the Committee on Appropriations and asked for a particular appropriation, which is already authorized, to fight it on the ground that it is not necessary; but we know what would be the result. In view of the fact that hundreds of millions of dollars have already been expended on the project, the argument would be made, "We have now spent this money, and are we going to waste it or are we going to make an additional expenditure so as to make good what has heretofore been expended." Under those circumstances it is likely that Congress would make the appropriation.

Continued on next page.

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HON. GEORGE W. NORRIS—*Continued*

for improved and more economical use in its application to the soil are absolute necessities to the future welfare of the human race. No private corporation or monopoly would be justified in making the costly experiments which are necessary to bring about this economy. Many of these experiments will not only be expensive but they will probably be failures. Improvements must not only be made in the production of fertilizer, but as great a field for improvement is open in its use and application to the land. In carrying out these experiments it will often happen that not only is the material in the fertilizer and the cost of its production a loss, but that the soil to which it is applied is completely put out of productive use in its application.

It is seen, however, that while the Government engaged in this great enterprise at Muscle Shoals with the best of intentions and for justifiable reasons, we have on hand a vast amount of water power which will not be used in the production of fertilizer. It is true that the trend of improvement may change. It may be that through the ingenuity of chemists and other scientific men the cyanamid process will again, through some improvement, come into general use, or some new process may be invented which will require a larger amount of power than is utilized under present modern facilities. But the trend of modern investigation and modern improvement is all in the other direction.

The question now is, and for 10 years has been, what shall the Government do with this great investment? The original act providing for the construction of this great plant provided specifically that the Government property there should never be leased to any private monopoly, but that it should be operated by the Government itself.

In the first place, no private individual can be expected to spend the vast sums of money necessary in carrying on experiments for the cheapening of fertilizer production. To make this a success it is and always must be a Governmental proposition, and it seems, therefore, proper that the primary and first object the Government should have in view is the utilization of this property for experimental purposes in fertilizer. Moreover, if a private individual or corporation should discover an improvement of importance in the fertilizer industry he would at once secure patent and have a monopoly. Any improvements which may be made by the Government in its experiments with new improved processes would be open to the world and manufacturers and dealers in fertilizer would be able to adopt the improved methods developed by the Government.

No one contends that there could be manufactured at Muscle Shoals sufficient fertilizer to supply the needs of the country. Its value, therefore, is mainly as an experimental plant. It should be carried on on a large scale. The measure provides for the largest and most expensive experiment in the production, distribution, and application of fertilizer that has ever been undertaken in the history of the world, and all of this expense will be paid for by the sale of surplus power.

The fertilizer proposition is growing more acute every year. The use of fertilizer in the agricultural regions of the South and East is not only desirable but absolutely necessary. The extent of the territory to which fertilizer becomes necessary is growing year by year. It is almost

Continued on next page.

Con

HON. SIMEON D. FESS—*Continued*

I think that is a most extraordinary grant of power; that it is one which never ought to be written into any bill. I do not believe it is wise to give to an independent board, in charge of a project on which $123,000,000 have already been expended and in connection with which the pending measure authorizes the expenditure of $52,000,000 more, unlimited authority in their own discretion, to make any improvements which they may see fit without asking for further authority. Further authority, of course, will not be necessary, for it is granted by the joint resolution.

I think everybody must admit that if the Government is launched into any commercial transaction in which there are any great number of units it is unfair for the Government to compete with those private industries. The danger is that the Government's competition will put out of business the independent units, and it seems to me that it is not a fair proposition, in spite of what has been said in the tariff discussion.

There is a great drift today toward concentration throughout the world. I do not think it would be wise for us to attempt to interfere with that general drift. It is in the interest both of lower cost to the public and more efficient production. But it will never do to allow the concentration to go uncontrolled. The Government must keep its regulatory power over all units of production which might become monopolistic. I think there is no doubt in our minds about that necessity. But when we are considering an industry in which many citizens are engaged, if the Government goes into competition with those citizens, the Government does not count the elements of cost those citizens must count, and if the Government does not proceed in a way that will lead to a profit, but runs the business at a los, and then out of the Treasury makes up the loss, it is unfair to the individual producer who is in competition with the Government.

What strikes me as strange, having some fair familiarity with the position the fathers throughout the South took on questions of this kind, is the changed attitude of the people of the South. Jefferson said that that is the best government which governs least. Jefferson never wanted to put the Government into competition with individuals. Jefferson did not want to meet the Government in every person he met on the street. He did not want to multiply Government agents; and that was a sound rule, and it permeated the whole country.

The one reason why I am opposed to the Government going into a business like this is that it has such a deadening effect. The routine, the deadly uniformity, the deadening effect upon individuals employed is obvious to everybody. There is no liberty. Bureaucracy spreads its net and kills the spirit. What I want to see is the liberalism in the life of the Nation that we see in the freedom of the press, the freedom of speech, the freedom of assembly, the open door of opportunity, the freedom of leadership where leadership does not come through seniority in service but comes through the rugged struggle of merit in the work. I want to see those avenues kept open, and they cannot be kept open under Government operation.—*Extracts, see 2, p. 160.*

Pro

HON. GEORGE W. NORRIS—*Continued*

imposible to exaggerate the importance of the fertilizer question. It is a mistake to think it is entirely an agricultural proposition. The consumers of the country are just as much interested in cheap fertilizer as is the farmer who produces the crop. We are justified in making every effort to cheapen the fertilizer process, either from a peace standpoint or from a war standpoint, but when we combine the two and see how they work so harmoniously together it is difficult to understand how any citizen having in mind the future welfare of our country can object to the expenditure of public funds in this direction. —*Extracts, see 1, p. 160.*

Pro

HON. HIRAM W. JOHNSON

U. S. Senator, Calif., R.

IT seems to me, without discussing in detail what may be sought in the one case or the other, this is plainly a proposition of whether or not, when the United States Government has expended $150,000,000 in a project it shall continue with that project for the benefit of the people of the United States.

I do not quarrel with those who hold the opposing view. I recognize that they are just as earnest and just as honest in the view they present for the turning over of this particular project in the manner that they suggest as we who believe that when the Government itself has expended the people's money it should have been expended for all the people, and that the Government should carry on the enterprise whenever necessary for the benefit of all the people.

I have heard it said that the Senator from Nebraska (Mr. Norris) was dreaming dreams. Maybe he is right. Perhaps the Senator from Nebraska, in what he asks, is dreaming dreams; but since man emancipated himself, men have been dreaming dreams for man and mankind, and it is the dreaming of these dreams that has marked the mileposts in human progress during all the centuries past.

I can recall historically that Galileo dreamed dreams. He dreamed his dreams, and, though compelled to recant under the threat of torture, his frightened lips yet told the immutable and the unchangeable truth.

Newton dreamed a dream as he lay upon the ground and saw an apple fall. He dreamed a dream that now we all understand.

Columbus dreamed a dream of another world far beyond the oceans that then were known—a dream at which every court scoffed and every courtier laughed. We are here today because Columbus dreamed that dream.

The men who landed at Plymouth Rock and those who came to Jamestown dreamed a dream of a new empire and a great, new nation. That dream we of this generation realize in part.

Continued on next page

Con

HON. J. THOMAS HEFLIN,

U. S. Senator, Alabama, Democrat.

ONE of the great problems Congress now has before it is the conservation of the water power of the Nation, the circumvention of the Power Trust people in their efforts to gobble up all the power sites in all the States of the Union.

A few years ago in my State a distinguished citizen saw the Tennessee River at its best. The flood was on, and he said, "There is a giant in that river. Some day he will be harnessed and put to work for the human family."

That prophecy has come true. This giant has been harnessed, in part, at Muscle Shoals, where the Government has spent many millions of dollars. The purpose of erecting this dam at Muscle Shoals was to make nitrate for the Government in time of war and fertilizer for the farmers in time of peace. I have sought for 10 years in the Senate to hold legislation true to that purpose. I have helped to pass two bills through the Senate for the operaion of Muscle Shoals. I have seen one of them fail in the House, and another one fail because of a pocket veto of the President.

After the Ford offer was withdrawn, I supported the Cyanamid bid, not in the form submitted, but I suggested that with certain amendments I would support it in preference to Government operation. I would do that today with any responsible concern in the country. I am opposed to Government operation in anything where private enterprise and industry can be found that will carry on the business.

In Alabama those of us close to this proposition have watched two great forces struggling to prevent the disposition of Muscle Shoals. Those two forces are the Power Trust and the Fertilizer Trust. The Power Trust does not want Muscle Shoals operated by the Government or by any private enterprise which it cannot control. It does not want the country to know how cheaply hydroelectric power can be produced. That is the main reason for its opposition.

The Fertilizer Trust does not want fertilizer made at Muscle Shoals; it does not want the farmer to know how cheaply fertilizer can be produced, and that accounts for its opposition.

These forces have secretly and otherwise manipulated this proposition in the Congress and elsewhere. They have carried on their propaganda through the newspapers and they have succeeded in preventing anything being done.

I have said repeatedly in the Senate that it is a reflection upon Congress that we cannot dispose of Muscle Shoals, put it to work, and get some good out of it.

There are five units, I believe, in the big dam constructed at Muscle Shoals. Four of them are idle. Some sixty or seventy-five thousand horsepower is going to waste every day. It is a crying shame; I repeat, it is a reflection upon the Senate and the House, upon the whole Government, that we have not disposed of this power; that we are not utilizing this power—*Extracts, see 7, p. 160.*

Pro

HON. HIRAM W. JOHNSON—*Continued*

Garrison and Wendell Phillips dreamed a dream—a dream that resulted in one of them being mobbed in New York and another chased by a populace in Boston. Just think of it! But Lincoln brought the realization of that dream.

Roosevelt dreamed a dream of the Panama Canal. Today it is the greatest engineering feat in all the world.

The Senator from Michigan (Mr. Couzens) dreamed a dream in the city of Detroit—of Detroit public ownership there. Today that public ownership exists profitably for the city of Detroit.

Down in the city of Los Angeles a self-educated engineer named Mulholland dreamed a dream that water might be brought for domestic purposes 250 miles, over gorges and canyons and impassible mountains. First he was laughed at. That dream today is a realization, and Los Angeles draws its great water supply from the Owens Valley, 250 miles distant.

Some men in the city of San Francisco years ago dreamed a dream when the city was in the grip of a street railroad that wrought its own will as its pleased. They dreamed a dream that San Francisco might operate a municipal road. Today San Francisco operates that road, operates it on a 5-cent fare, and the municipal road there, in opposition to that privately owned, is operated successfully, prosperously, advantageously.

So it has been with dreams of real men during all the years, for dreams mean but one thing, that humanity may benefit, people may prosper, and human beings may be a bit happier.

So the dream of the Senator from Nebraska I can appreciate. I trust he will continue iterating and reiterating. Never mind what ephemeral catastrophe there may seem to be, for dreams such as are his ultimately will prevail, for the truth prevails. Sometimes it is as dangerous to preach the truth as to enter a powder magazine with a lighted torch, but, nevertheless, truth yet exists; and all history has taught us, all people's governments have taught us, that whatever may be the check, whatever may be the defeat, whatever the haltings, the heartburnings, and the disappointments, they are but ephemeral, and ultimately, finally, the truth will prevail.

As I listened to some of the debate I thought that possibly for the first time in our history it was suggested that the Government continue with a project that the Government had begun and upon which it had expended the enormous sum of $150,000,000. I thought, as I listened to some things that were said, that the Senator from Nebraska was asking an adventure in a field which never before had been touched governmentally in this land. Then I recalled project after project where we had

Continued on next page.

Con

THE AMERICAN FARM BUREAU FEDERATION

THE fundamental position of the American Farm Bureau Federation relative to Government in business was stated in legislative resolutions No. 1 and No. 2 adopted at the organization meeting in November, 1919. These resolutions are unequivocal in their statements that the method to be pursued on the part of the Federal Government in protecting the public against corporate aggregations is by regulation and supervision and not by the direct ownership and operation by the Federal Government of corporate enterprises. These resolutions also make it impossible for anyone representing the Farm Bureau to support Government operation at Muscle Shoals or elsewhere. They read:—

1. "When State or Federal Government grants corporate rights to any organization it is incumbent on that Government to protect the public through such regulative legislation as will best prevent favoritism, stimulate initiative and guarantee adequate public service."

2. "We are opposed to Government ownership of public utilities. We demand the early return of the railroads to private control, under such conditions and regulations as will render adequate service at just and equitable rates. . . ."

The continuance of the above position in favor of Federal supervision of enterprises like Muscle Shoals with a direct statement in favor of private operation as provided in the Ford offer is stated in resolution No. 16 adopted at the third annual convention in November, 1921. It reads:—

"We recognize in the Muscle Shoals nitrate waterpower project in Alabama such an essential measure to secure the preservation of our soil resources as well as to develop the industrial and transportation facilities of our nation, that we urge the Congress of the United States to authorize the Secretary of War to enter into such contract or contracts with Henry Ford for the completion and continuous operation of the porject as will protect the public welfare. If such authority is not promptly given, we reserve the right to institute such action as will guarantee the completion and operation of this enterprise under Federal supervision."

In December, 1922, the resolution on Muscle Shoals reads:—

"We re-affirm the resolution of our last Annual Meeting at Atlanta, Ga., relating to Muscle Shoals and asked Congress to give us a vote upon this matter without further delay."

In December, 1923, at the fifth Annual Meeting, the American Farm Bureau Federation position was stated as follows:—

"We re-affirm our advocacy of the Henry Ford offer relating to water power, steam power, and nitrate plants at Muscle Shoals and urge Congress to give us a vote upon this matter without further delay."

In December, 1924, at the sixth Annual Meeting, although the Ford offer had been withdrawn, the Farm Bureau did not alter its policy, but again restated its

Continued on next page.

Pro

HON. HIRAM W. JOHNSON—*Continued*

gone on governmentally in exactly the way that the Senator from Nebraska asks that we proceed in the Muscle Shoals matter. We have now under operation, maintained by the Government of the United States, many reclamation projects, many reclamation projects in which we develop power, the United States of America develops power, and the United States Government, through its Reclamation Service, sells that power. The idea that it is an impossibility for a political subdivision or a municipality to do that which constitutes a monopoly in the public service as well as it can be done by an individual or a specific private corporation is an idea to which I will not for one instant subscribe. It is true that at times in municipal operations there are errors that are grave. It is true that at times in municipal operation political considerations may control. It is true that there are other mistakes, many and manifold, in municipal operation; nevertheless, wherever it has been honestly administered, municipal operation has no reason to feel that it has not equaled private operation, and certainly where the opportunity exists for comparison it has been of infinitely greater benefit to the people served.

Just adjoining us is Ontario. There the great Province itself has undertaken to do for itself, by public enterprise, that which the Senator from Nebraska would have done under his measure concerning Muscle Shoals. I quote just a paragraph from an article appearing in the *Toronto Globe*, one of Canada's chief newspapers, concerning the Ontario Power Commission, which there manufactures, sells, and administers power for the Province of Ontario. The article is as follows:

"In benefit to the people, hydroelectric enterprise stands out among the first, and perhaps as the very first, of the achievements recorded in Ontario since confederation. It has immensely increased the comfort of Ontario homes, lessened the drudgery of Ontario housewives, improved and cheapened transportation and the lighting of the streets, and given a tremendous impulse to Ontario industry.

"For all this the credit must be given to Sir Adam Beck more than to any other man. He has made enemies, and the people of Ontario can fairly say that they love him for the enemies he has made.

"We refer especially to the enemies of public ownership, not only in Ontario but all over Canada and the United States.

"They hate the hydroelectric, not for its faults but for its merits. They hate it because it has rescued the people of Ontario from the greed of gain which has laid heavy burdens upon many of the communities in the United States.

(Continued on next page)

Con

THE AMERICAN FARM BUREAU FEDERATION—*Continued*

position in favor of private operation of the project and described in its resolution the principles which it continued to advocate as follows:—

"We hold the same position on the disposition of the power and property at Muscle Shoals that we have heretofore; namely, the utilization of the largest portion of the hydroelectric power for the manufacture of concentrated fertilizers, containing at least 40,000 tons annually for pure nitrogen; limiting the profit to 8%; low interest rate on borrowed money; amortization of the principal; a farmer board to pass upon the cost of production, distribution and profit and assuring that the original low cost of the fertilizer be maintained when the product is resold before its reaches the farmer. Any delay in arriving at a policy at Muscle Shoals by the appointment of a commission is opposed."

In December, 1925, at the seventh Annual Meeting it is noted in the resolution adopted relative to Muscle Shoals that the organization still held tenaciously to its principle of private operation and had begun plans which, it was hoped, would secure one or more private leases for its consideration. The resolution of this year reads:—

"Delay in the construction and disposition of Muscle Shoals has cost the people of the United States at least $15,000,000.

"We again urge Congress for disposition of the property in the same manner as we requested a year ago. 'Utilization of the largest portion if not all, of the hydroelectric power for the manufacture of concentrated fertilizers containing not less than 40,000 tons of pure nitrogen; limiting the profit to 8%; low interest rate on borrowed money; amortization of the principal; a farmer board to pass upon the cost of production, distribution and profit and assuring that the original low cost of fertilizer be maintained when the product is resold before it reaches the farmer.'

"A small joint Congressional committee appointed to receive bids to lease the property, under the aforementioned conditions, choose between them and present the best to Congress with its recommendation for action should expedite the proper disposal of this problem."

At the eighth Annual Meeting held in December, 1926, a rather complete enumeration of features which the organization insisted upon having included in any lease is given in the resolution of that year together with an approval of a lease then pending made by the American Cyanamid Company which most nearly complied with the ideas sought by the organization. The proposed lease of the American Cyanamid Company was selected by the organization in preference to all others submitted to the Congressional Joint Committee on Muscle Shoals, set up to receive offers from all sources. The resolution reads:—

"Further delay in deciding upon the national policy at Muscle Shoals is indefensible. That policy, when adopted by Congress, must contain among other features, the following: A unit lease of the power, fixation plant, and accessories; a fifty-year term of lease; the production of fertilizers containing at least 40 per cent plant food; the elimination of royalties for the use of patented air-fixation processes; the use of Nitrate Plant No. 2; a Farmer Board with adequate functions in regard to cost

(Continued on next page)

Pro

HON. HIRAM W. JOHNSON—*Continued*

"They would be pleased to see the hydroelectric destroyed, weakened, or discredited, so that they might share in the plunder and prevent the example of public ownership from spreading."

Is it asserted that what the Province of Ontario can do the Government of the United States cannot do? I have not so poor an opinion of my Government or its administration as for an instant to concede that they cannot accomplish what the Province immediately adjoining us has accomplished.

After all, this is not in its initial presentation a matter of governmental ownership or governmental control at all. Here in the first instance is the expenditure of a tremendous, an enormous sum, by the Government, and the question thus becomes not one first of Government ownership.

The question is, after the United States Government has expended $150,000,000, must the United States Government, upon the plea that has been made, turn over the possibilities which lie in the power that may be developed there, and also in the matter of fertilizer, to a private corporation or a private individual, because it is too weak or too dishonest to proceed with what it has thus inaugurated. That, after all, is the question presented, rather than one of Government ownership, or Government maintenance, or Government control.

I submit, Mr. President, under the peculiar circumstances, there should be little difficulty in the solution of the problem, for these gentlemen who inveigh most strongly against Government control or Government operation provide for it as the alternative in the very measure which they present. So, after all, it comes back to whether the Government shall proceed with what the Government has inaugurated.

The possibilities of electrical power no man can foresee at this time. The possibilities in dealing with the every-day, hum-drum life of the ordinary citizen none can foretell. What it may do for the farm, what it may do for the housewife, is eloquently depicted. What it may do for these States where this power is generated requires no fervid imagination to conjure up.

So, with the expenditure of the money by the Government, $150,000,000 or thereabouts, with a desire to preserve that which belongs to them for all the people, aye, with a desire to see the realization of the dream of the Senator from Nebraska concerning future generations.—*Extracts, see* 3, *p.* 160.

Con

THE AMERICAN FARM BUREAU FEDERATION—*Continued*

factors in manufacturing fertilizers and relative to the geographical distribution of same; no separation of power from fertilizer production; a rapid progress to the annual capacity production of the project; and definite assurances without possibility of evasion, that the project will be devoted in peace times to the fixation of atmospheric nitrogen and the making of fertilizers. Under legislation now pending in Congress this policy can be best advanced by Congress passing the necessary legislation to approve the proposal made under date of April 24, 1926, by the American Cyanamid Company."

In December, 1927, at the ninth Annual Meeting the continuity of the position of the American Farm Bureau Federation relative to private operation at Muscle Shoals was not broken. The resolution of that year reads:—

"We re-affirm our support of the principles now contained in the Madden bill, H. R. 16614, of the 69th Congress."

After a decade had elapsed in the formation of policies of the organization it is found that during the tenth Annual Meeting in December, 1928, the position of the organization on Muscle Shoals is identically that which it was at the beginning of the Muscle Shoals controversy. The resolution of 1928 is as follows:—

"We continue our support of the principles contained in the bill bearing the name of the late Congressman Martin B. Madden of Illinois which provides for the full time capacity operation of the Muscle Shoals project by a lessee who is obligated to fix atmospheric nitrogen and manufacture and distribute it in the form of highly concentrated fertilizers at a profit limitation of eight per cent, using the power at Muscle Shoals for the above purpose."

The last official statement of this national farm organization was promulgated by the official voting delegates in attendance at the eleventh Annual Meeting in December, 1929. The resolution is clear cut and unmistakable in meaning. It seems to indicate a beginning of a second decade of effort on the part of the Federation to secure more business in government, less government in business, and Federal regulation and supervision of business affairs so that the public welfare may be protected. This last resolution reads as follows:—

"There is no shortage in the supply of commercial fertilizers. The limiting factor is price. This factor cannot be expected to be reduced materially so long as a world combination in which the Chilean Government has a part, fixes prices. Muscle Shoals should be operated so that its economies will tend to regulate our fertilizer prices instead of the foreign combination controlling them.

The operation of Muscle Shoals on a vast commercial scale at the earliest possible moment would be incomparably better than to use this great project for mere laboratory research. Such commercial operation is provided in the Madden-Wright Bill, and all necessary research is also provided in that measure without cost to the United States.

We commend the recent message of President Hoover in advocating a private lease for this project and confining its use to agriculture."

Cyanamid vs. Synthetic Nitrogen

Cyanamid

CYANAMID has been adopted as a trade name throughout the world, although the older terms, "lime nitrogen" and "kalkstickstoff," still persist in Europe to a limited extent. The product to which the trade name cyanamid applies is not the chemical compound listed by the organic chemist, but is that material obtained when nitrogen is absorbed by properly prepared calcium carbide. Due to variations in the quality of carbide and in the method of conducting the process, the product is not of uniform quality throughout the world and there may be a wide variation in nitrogen content. In general cyanamid produced outside of the United States contains less than 20 per cent. of nitrogen and a portion of the European production analyzes only 16 to 17 per cent. of nitrogen, which is about the same content as that of Chile nitrate.

The practice of making this low-grade product abroad was based on the theory that by making cyanamid of the same nitrogen content as nitrate of soda from Chile the two products would be interchangeable in agricultural practice. For the past fifteen years there has been little or no progress abroad toward increasing the content of nitrogen in the product, and most of the plants today are producing the same grade of material that they started with years ago. Only one or two have exceeded the 20 per cent. limit of nitrogen content and that only to a slight degree.

In America the history of the industry is quite the opposite. From the beginning the aim has been to produce a product containing the maximum quantity of nitrogen, and our industry has shown steady development along those lines. Starting in 1910 with a product containing 16-17 per cent. nitrogen, we rated about 21 per cent. in 1917 and are, with our latest development in equipment, now averaging 23.5 per cent. in the crude product before conversion to fertilizer.

In Europe the principal outlet for the cyanamid process prior to the war was through direct application to the soil or conversion into sulphate of ammonia. When the war came along the few cyanamid plants then existing there turned their attention to the production of ammonia, nitric acid and their derivatives, and a number of plants were built with the sole object of producing munitions. At the close of the war these plants again turned to agriculture for their principal outlet.

In this country the direct purchase of fertilizer materials by the farmer has not been the general practice, and most of the cyanamid has found its way into agriculture either through the mixing plants or as "Ammo-Phos," a crude form of ammonium phosphate developed here in America. Its alkaline nature coupled with its high percentage of available nitrogen makes it a superior product, as proven by the tremendous growth in its use by the foremost European agricultural countries.

Under American condtions the cyanamid process is the cheapest one for fixing nitrogen, and represents the only type of fixation process on this continent which

Continued on page 157

Synthetic

FROM a study of the statistics there can be no doubt that the fixation of atmospheric nitrogen for agricultural and peace-time uses, as well as for war use, is here to stay. Not only does it appear that the products of such fixation can successfully compete with Chile nitrate but also that atmospheric nitrogen is displacing and will continue, in a large and perhaps increasing measure, to displace Chilean nitrate. Of the three atmospheric nitrogen fixation processes, the position of major prominence held by the direct synthetic ammonia process can not be disputed. Not only is the production by this process far in excess of the combined production of the arc and cyanamide processes but the capacity in the former case is being greatly increased, while no expansion in the two latter processes is anticipated. In fact, a part of the increase in capacity of the direct synthetic ammonia process is to displace cyanamide process capacity. Of the hydrogen required for the fixation of nitrogen, according to the direct synthetic ammonia process, 82 per cent is produced through coal, either from water gas or by-product coke-oven gas, as compared with 15 per cent by the electrolysis of water. The world is fast becoming less and less dependent upon Chile as its source of supply of inorganic nitrogen, while several of the major nations have reached or are approaching the position of total independence of foreign sources of supply.

Commercial fixation may be considered as having started in 1903, when the first successful experiments were carried out in Norway by Birkeland and Eyde. This method, known as the arc process, is the result of attempts to emulate the lightning discharge.

Although, with a few small exceptions, fixation by this process has been confined to Norway, and has never become a large factor in the world supply, nevertheless, it served as the pioneer, which was soon followed by the cyanamide process, and later by the direct synthetic ammonia process.

The atmospheric nitrogen fixation industry has enjoyed a rapid growth, stimulated, no doubt, by the war, but also later undoubtedly retarded by the effects of the war. From the small beginning of 1903 production increased to 9,000 tons for the year 1910, and over 600,000 tons for the year 1925. While this production in 1910 represented but 1.4 per cent of the total production, the 1925 fixed atmospheric nitrogen production, which was approximately equal to the total world nitrogen production of 1910, represented 45 per cent of the total 1925 production.

Of the 1925 production, but 41,000 tons, or 6.7 per cent, were fixed by the arc process, 188,000 tons, or 30.3 per cent, by the cyanamide process, and 390,000 tons, or 63 per cent, by the direct synthetic ammonia process.

The nitrogen fixation industry is developing so rapidly, capacity and production figures are ever changing. New direct synthetic ammonia plants are being erected, plans

Continued on page 157

The 71st Congress

Duration of the 70th Congress, March 4, 1929-March 4, 1931

First, or "Special" Session, Convened April 15, 1929 Adjourned November 22, 1929

Second, or "Long" Session, Began December 2, 1929.

In the Senate
Membership
Total—96

53 Republicans 39 Democrats
1 Farmer-Labor
2 Vacancies

Presiding Officer
President: Charles Curtis, R.
Vice-President of the United States

Floor Leaders

Majority Leader	*Minority Leader*
James E. Watson, Ind., R.	Joseph T. Robinson, Ark., D.

In the House
Membership
Total—435

267 Republicans 165 Democrats
1 Farmer-Labor
3 Vacancies

Presiding Officer
Speaker: Nicholas Longworth, R.
Member of the House from Ohio

Floor Leaders

Majority Leader	*Minority Leader*
John Q. Tilson, Conn., R.	John N. Garner, Tex., D.

The Coming Month in Congress

By **Norborne T. N. Robinson**

IN the hope of reaching an adjournment of Congress on June 14, leaders in the House and Senate have worked out a program by means of which they hope to dispose of all important pending legislation by that date.

As has been the case since the beginning of the present session last December, the Tariff Bill is dominating the legislative situation.

Progress of the Tariff Bill

Passed by the House on May 28, 1929, this measure has been hanging on for nearly a year. After extended hearings during the summer of 1929 by the Senate Committee on Finance and after prolonged debate in the Senate, marked by an almost complete dissipation of party lines, the bill was finally passed by the Senate on March 24, 1930.

The bill, as originally passed by the House, was considerably changed by the Senate. The House promptly voted to disagree to the Senate amendments and ask for a conference. On April 2 the Conference Committee received the bill and began work on composing the differences between the two Houses.

Partial Report of Conference Committee

On May 1 the Conference Committee made a report on part of the bill, including several of the schedules and on the provisions, added by the Senate, repealing the

flexible provision of the existing law, under which the President, through the Tariff Commission, is allowed to raise or lower certain duties to meet emergency competitive conditions, and the farm debenture provision, added to the bill in the Senate.

In their report of May 1 the House conferees informed the House that they had refused to concur in the flexible tariff and debenture provisions. On May 3 the House took a vote on the report of its conferees and upheld their position. The bill, therefore, went back to conference and the Conference Committee will make the same report to the Senate for action by that body.

This preliminary conference report covers most of the highly controversial provisions of the bill and when it is acted upon by both Houses the way will have been paved for more rapid progress on the rest of the bill. Leaders in both Houses feel that the Tariff Bill will receive final action by Congress and go to the President during the first week in June.

The London Treaty

Equal in prominence to the Tariff Bill in the legislative program is the London Treaty for the Limitation of Naval Armaments. Actual consideration of the treaty concerns the Senate only, but connected with it is the Naval Appropriation Bill, since the appropriations for construction of naval vessels, particularly cruisers, are affected by the London Agreement.

The London Treaty was signed in London on April 22. President Hoover forwarded it to the Senate on May 1 and it was referred to the Senate Committee on Foreign Relations. Senator William E. Borah, Idaho, R., chairman of the committee, announced that hearings would be held by the committee before the treaty was reported to the Senate.

American Delegates to Be Heard

The American delegates to the London Conference will be invited to appear before the committee, if they so desire. If they appear, the hearings will either be secret or open, according to the wishes of the delegates.

Senator Frederick Hale, Maine, R., Chairman of the Committee on Naval Affairs, has announced that his committee will hear Charles Francis Adams, Secretary of the Navy, on the technical phases of the treaty, after the hearings of the Committee on Foreign Relations are concluded. It was expected that the Foreign Relations Committee hearings would begin on May 7.

Committee Hearings Arranged

Whether the Foreign Relations Committee hearings are open or secret or even if Henry L. Stimson, Secretary of State, who was chairman of the American delegation at London, does not appear at the hearings, it is expected that the Senate will have full verbal reports on what happened at London when the treaty comes up for debate. Two of the delegates at London are members of the Senate, Senator David A. Reed, Penna., R., and Senator Joseph T. Robinson, Ark., D.

They are both expected to address the Senate at some length and their reports will unquestionably have vital influence with their fellow Senators.

While some opposition to the ratification of the London Treaty is anticipated, the consensus of opinion among Senators is that it will be ratified as soon as Senators have had an opportunity to study it.

Unemployment Legislation

Following the vote on the confirmation of Judge J. J. Parker, of North Carolina, whose nomination by the President to be Associate Justice of the Supreme Court of the United States is meeting with strong opposition, the Senate is expected to take up one of the unemployment bills introduced by Senator R. F. Wagner, N. Y., D. The vote on Judge Parker's nomination is expected to be taken about May 7 or 8. The Wagner bill provides for a Federal employment agency to work in cooperation with state employment agencies.

Next on the Senate program is a resolution introduced by Senator Claude A. Swanson, Va., D., making changes in the Senate rules and after that will come one of the water power bills introduced by Senator James C. Couzens, Mich., R.

Prohibition Reorganization Act

Prompt action is expected on the Prohibition Reorganization Act of 1930. This bill (H. R. 8754) provides for the transfer of the prohibition enforcement machinery from the Treasury to the Department of Justice. It passed the House on February 8 and was reported from the Senate Committee on the Judiciary on May 5, with a few amendments of non-controversial nature. It is expected to pass promptly whenever called up and apparently will be the only prohibition measure of any sort to be acted upon at this session of Congress. (See Congressional Digest for March, 1930.)

Communications Bill

The Couzens Communications Bill is being drafted by the Committee on Interstate Commerce and probably will be reported before the end of the session. Action on it, however, is not expected until next session. (See Congressional Digest for April, 1930.)

In the House the system of weekly programs is continuing. During the first week of May the Legislative Appropriation Bill will be considered, to be followed by the Naval Appropriation Bill.

The Appropriation Bills

On May 1, three of the regular annual appropriation bills had been passed and signed by the President—The State, Justice, Commerce, and Labor Bill; the Independent Offices Bill and the First Deficiency Bill. Three others had passed both Houses and has been sent to conference—The Interior Department Bill, the Agricultural Department Bill and the Treasury and Postoffice Department Bill. Two had been passed by the House and reported to the Senate from the Committee on Appropriations—the War Department Bill and the District of Columbia Bill. The Legislative Bill had been reported to the House.

The only two bills yet to be reported to the House are the Navy Department Bills and the Second Deficiency Bill. The former was held up awaiting the action of the London Conference since the appropriation for naval construction depends upon the London Treaty. The Second Deficiency Bill is always passed during the closing days of the session, as it is designed to cover various items left out of other appropriation bills or made necessary because of emergencies.

Action Taken by Congress

A Daily Summary of the Proceedings of the House and Senate

March 21, 1930 to April 17, 1930

Note—This department contains a record of action on the floor of the House and the Senate. By following it from month to month the reader obtains a compact but complete review of the work actually done by Congress throughout the session. The principal abbreviations used are the following: H. R. means House bill; H. Res. means House Resolution; H. J. Res. means House Joint Resolution; H. Con. Res. means House Concurrent Resolution; S. means Senate Bill; S. Res., Senate Resolution; S. J. Res., Senate Joint Resolution, and S. Con. Res., Senate Concurrent Resolution. If reference is made to the consideration or action by the Senate of a House bill or resolution, it means that the House has passed it and sent it to the Senate, and vice versa.

Friday, March 21, 1930

Senate:

Mr. Blease, S. C., D., spoke on police affairs in the District of Columbia.

Resumed consideration of H. R. 2667, the tariff bill.

Messrs. McMaster, S. D., R., Hatfield, W. Va., R., Barkley, Ky., D., Goff, W. Va., R., Copeland, N. Y., D., Trammell, Fla., D., Fletcher, Fla., D., Norris, Nebr., R., and others spoke on the bill.

Held night session for further consideration of the tariff bill.

Recessed.

House:

Passed H. J. Res. 264, making an appropriation of $300,000 to complete the restoration of the frigate "Constitution."

Agreed by a vote of 318 to 14, (not voting, 96), to have further discussion on H. R. 10288, for the regulation of the transportation of persons in interstate and foreign commerce by motor carriers operating on the public highways.

Representatives Denison, Ill., R., McSwain, S. C., D., Burtness, N. D., R., Lankford, Ga., D., and others spoke on the bill.

Adjourned until Monday, March 24, 1930.

Saturday, March 22, 1930

Senate:

Discussed the resignation and record of J. D. E. Meyers, district attorney for South Carolina.

Executive session.

Resumed consideration of H. R. 2667, the tariff bill.

Messrs. George, Ga., D., McKellar, Tenn., D., Howell, Nebr., R., Bratton, N. Mex., D., Hale, Maine, R., Walsh, Mass., D., Capper, Kans., R., Fletcher, Fla., D., and others spoke on the bill.

Recessed until Monday, March 24, 1930.

House:

The House was not in session.

Monday, March 24, 1930

Senate:

Mr. Heflin, Ala., D., called attention to the acquittal of E. L. Doheny on charges of bribing Albert B. Fall when the latter was Secretary of the Interior, and described the act as a "farcial performance."

Resumed consideration of H. R. 2667, the tariff bill.

Defeated by a vote of 71 to 9 (not voting, 16), a motion to recommit the tariff bill to the Senate Finance Committee.

Passed by a vote of 53 to 31 (not voting, 12), H. R. 2667, the tariff bill, with amendments.

Discussed conference report on H. R. 9979, the First Deficiency bill.

Adjourned.

House:

Passed H. R. 11045, increasing the appropriation, not to exceed $1,077,745.74, for the acquisition of a site for the new House Office Building.

Resumed consideration of and passed, by a vote of 219 to 115 (not voting, 64), H. R. 10288, the motor-bus bill, to regulate the transportation of persons in interstate and foreign commerce by motor carriers operating on public highways.

Passed S. 3371, amending section 88, of the Judicial Code, changing the terms of court in three cities in Michigan.

Representative Ramseyer, Iowa, R., spoke on the procedures of framing tariff bills.

Representative Frear, Wis., R., spoke in criticism of the parliamentary procedure followed by the House in passing the tariff bill, H. R. 2667.

Discussed H. R. 10813, the District of Columbia appropriation bill.

Adjourned.

Tuesday, March 25, 1930

Senate:

Passed S. J. Res. 135, authorizing and requesting the President to extend to foreign governments invitation to join the Government and people of the United States in the observation of the 150th anniversary of the surrender of Lord Cornwallis, at Yorktown, Pa., and appropriating $25,000 for the expenses thereof.

Passed H. R. 11045, increasing, not to exceed $1,077,745.74, the appropriation for the acquisition of a site for the New House Office Building.

Passed H. J. Res. 264, appropriating $300,000 for the restoration of the frigate "Constitution."

Passed S. J. Res. 93, appropriating $50,000 for a monument to Maj. Gen. William Crawford Grogas, late Surgeon General of the United States Army.

Passed S. 3189, appropriating $805,561, for the relief of flood stricken areas in South Carolina.

Passed S. 3487, for the acceptance of a donation of land and appropriating $900,000 for the construction thereon of suitable buildings and appurtenances for a forest products laboratory, at the University of Wisconsin.

Passed H. R. 7491, the Department of Agriculture Appropriation bill.

Passed H. R. 6120, the public buildings bill, authorizing an appropriation of $230,000,000 for public buildings throughout the country.

Adjourned until Friday, March 28, 1930.

House:

Representative Watson, Pa., R., delivered an address congratulating Greece upon the one-hundredth anniversary of its independence, March 25, 1830.

Agreed to conference report on H. R. 5616, amending the Act providing that the United States aid the States in the construction of rural post roads.

Resumed consideration of H. R. 10813, the District of Columbia appropriation bill.

Representative Box, Tex., D., spoke on Immigration.

Representative O'Connell, N. Y., D., spoke in opposition to prohibition.

Representative Hudson, Mich., R., spoke on H. R. 9986, the movie bill, to prevent block booking and blind booking in the moving-picture industry.

Adjourned.

Wednesday, March 26, 1930

Senate:

The Senate was not in session.

House:

Passed H. R. 8807, providing for the coordination of public health activities of the Government.

Passed H. R. 8637, providing that the rank and pay of Commandants of the Coast Guard be prescribed by or in pursuance to law for bureau chiefs of the Navy Department.

Representative Burtness, N. D., R., made an address eulogizing

Carl Ben Eilson, former Army Air Service aviator, who was killed in the far North in an attempt to rescue a ship crew.

Passed H. R. 10583, to revise methods of computing transit fees at the Panama Canal.

Passed H. R. 4293, providing a ferry and canal near the Pacific entrance of the Panama Canal.

Adjourned.

Thursday, March 27, 1930

Senate:

The Senate was not in session.

House:

Agreed to Senate amendments to H. R. 6120, the public buildings bill.

Resumed consideration of and passed H. R. 10813, the District of Columbia appropriation bill.

Adjourned until Monday, March 31, 1930.

Monday, March 31, 1930

Senate:

The Senate was not in session.

House:

Agreed to H. Res. 194, setting apart May 15, 1930, for the annual eulogies of deceased members of the House.

Adopted conference report on S. 3168, authorizing additional construction in connection with the Mount Vernon, Va., highway.

Agreed to H. Con. Res. 27, providing for the appointment of three Representatives and three Senators to represent Congress at the 260th anniversary of the founding of the Carolinas at Charleston, April 10, 1930.

Passed H. J. Res. 278, appropriating $30,000 for participation of the United States in the International Fur Trade Exhibition and Congress to be held in Leipzig, Germany, in 1930.

Passed H. J. Res. 274, making an appropriation of $25,000 for participation of the United States in the International Conference, for the Codification of International Law to be held at The Hague in 1930.

Representative Ragon, Ark., D., spoke on the tariff bill.

Adjourned.

Tuesday, April 1, 1930

Senate:

Discussed the *Literary Digest* poll on Prohibition.

Agreed to conference report on H. R. 5616, concerning Federal aid in the construction of rural post roads.

Passed H. J. Res. 278, making an appropriation of $30,000 for participation of the United States in the International Fur Trade Exhibition and Congress to be held in Leipzig, Germany, in 1930.

Passed H. J. Res. 274, making an appropriation of $25,000 for participation by the United States in the International Conference for the Codification of International Law.

Agreed to conference report on S. 3168, the Mount Vernon Memorial Highway bill.

Passed S. 498, granting certain public lands to the State of New Mexico for the use and benefit of the Eastern New Mexico Normal Scho..

Passed H. R. 8807, providing for the coordination of the public-health activities, after substituting it for S. 3167.

Passed S. 1171, to establish a national institution of health, to create a system of fellowships in said institution and to authorize the Government to accept donations for use in ascertaining the cause, preventions and cure of disease affecting human beings.

Passed several other bills on the calendar.

Passed H. R. 8960, the Departments of State, Justice, Judiciary, Commerce and Labor appropriation bill.

Adjourned.

House:

Passed H. J. Res. 283, making an additional appropriation for the Department of Justice for certain expenses.

Representative Underhill, Mass., R., spoke regarding the old frigate "Constitution," better known as "Old Ironsides."

Passed H. J. Res. 251, providing for the promotion of peace, equalization of the burdens, and minimization of the profits of war.

Adjourned.

Wednesday, April 2, 1930

Senate:

Passed H. R. 6153, authorizing the President to appoint a commission to study and report on the conservation and administration of the Public Domain.

Resumed consideration of S. J. Res., 49, the Muscle Shoals resolution, to provide for the national defense by the creation of a corporation for the operation of the Government property at and near Muscle Shoals, in Alabama.

Mr. Norris, Nebr., R., and others spoke on the resolution.

Messrs. Smoot, Utah, R., Watson, Ind., R., Shortridge, Calif., R., Simmons, N. C., D., and Harrison, Miss., D., were appointed conferees on H. R. 2667, the tariff bill.

Executive session.

Recessed.

House:

Agreed, after a lengthy discussion, by a vote of 241 to 153 (not voting, 33), to H. Res. 197, to send the tariff bill, H. R. 2667, to conference.

Representatives Hawley, Oreg., R., Treadway, Mass., R., Bacharach, N. J., R., Garner, Tex., D., and Collier, Miss., D., were appointed conferees on the bill.

Adjourned.

Thursday, April 3, 1930

Senate:

Passed H. J. Res. 283, making additional appropriations for certain expenses under the Department of Justice.

Resumed consideration of S. J. Res. 49, to provide for the national defense by the creation of a corporation for the operation of the Government properties at or near Muscle Shoals, Alabama.

Messrs. Norris, Nebr., R., McKellar, Tenn., D., Heflin, Ala., D., and others spoke on the bill.

Mr. Blease, S. .C., D., spoke on crime conditions in the District of Columbia.

Passed S. J. .Res. 152, extending the provisions of the resolution for the relief of farmers in certain storm stricken areas.

Ratified in executive session, a treaty "Revising the General Act of Berlin and General Act and Declaration of Brussels."

Recessed.

House:

Passed H. R. 10653, amending the law which provided for a foreign commerce service in the Bureau of Foreign and Domestic Commerce of the Department of Commerce.

Representatives Nelson, Wis., R., Elliott, Ind., R., Beers, Pa., R., Underwood, Ohio, D., and Lozier, Mo., D., were appointed conferees on H. R. 7960, the omnibus Civil War pension bill.

Passed H. R. 9557, to create a body corporate by the name of the "Textile Alliance Foundation."

Representative Patman, Tex., D., spoke on payment of Veteran's adjusted compensation.

Passed several other bills on the calendar.

Adjourned.

Friday, April 4, 1930

Senate:

Resumed consideration of and adopted by a vote of 45 to 23 (not voting, 28), S. J. Res. 49, the Muscle Shoals resolution.

Messrs. Vandenburg, Mich., R., Fess, Ohio, R., Norris, Nebr., R., and others spoke on the resolution.

Agreed to a motion making S. 51, to subject certain immigrants, born in countries of the Western Hemisphere, the unfinished business of the Senate.

Resumed consideration of H. R. 8531, the Treasury and Post Office Departments Appropriation bill.

Adjourned until Monday, April 7, 1930.

House:

Representatives Snell, N. Y., R., Beedy, Me., R., and Tucker, Va., D., were appointed as members of the House to attend the celebration of the 250 anniversary of the founding of the Province of Carolina, in pursuance to H. Con. Res. 27.

Passed several bills on the consent calendar.

Adjourned until Monday, April 7, 1930.

Monday, April 7, 1930

Senate:

Agreed to conference report on H. R. 7960, the Civil War omnibus pension bill.

Passed S. 2400, to regulate the height, exterior design and construction of private and semipublic buildings in certain areas of the District of Columbia.

Passed several other bills on the calendar.

Resumed consideration of S. 51, to subject certain immigrants, born in countries of the Western Hemisphere to the quota under the immigration laws.

Mr. Brookhart, Iowa, R., spoke on prohibition enforcement.
Adjourned.

House:

Passed H. R. 7390, authorizing the appointment of an assistant commissioner of education in the Department of the Interior.

Passed H. R. 9991, fixing the salary of the minister to Liberia, when appointed, at $10,000.

Passed several other bills on the consent calendar.

Passed S. 476, granting pensions and increase of pensions to certain soldiers, sailors and nurses of the war with Spain, the Philippine Insurrection, or the China relief expedition.

Passed H. R. 11143, to create in the Treasury Department a bureau of narcotics.

Adjourned.

Tuesday, April 8, 1930

Senate:

Resumed consideration of H. R. 8531, the Treasury and Post Office Departments appropriations bill.

Messrs. Nye, N. D., R., Schall, Minn., R., Blaine, Wis., R., and others spoke on the bill.

Mr. Tydings, Md., D., spoke on prohibition enforcement.

Executive session.

Recessed.

House:

Representative Sirovich, N. Y., D., spoke on Government, Communism, and Democracy.

Representative Stobbs, Mass., R., spoke on prohibition enforcement.

Agreed to H. Res. 200, for the consideration of H. R. 10630, providing for the consolidation of activities affecting War Veterans.

Agreed to conference report on H. R. 7960, the Civil War omnibus pension bill.

Adjourned.

Wednesday, April 9, 1930

Senate:

Convened in open executive session for the consideration of certain nominations.

Messrs. Copeland, N. Y., D., Capper, Kans., R., Vandenberg, Mich., R., Walsh, Mont., D., spoke on the nomination of Herbert B. Crosby, to be Commissioner of the District of Columbia.

Agreed to a motion that the Senate return to legislative business.

Messrs. Jones, Wash., R., Hale, Maine, R., Keyes, N. H., R., Borah, Idaho, R., Overman, N. C., D., and Harris, Ga., D., were appointed conferees on H. R. 8960, the Departments of State and Justice, for the Judiciary, and the Departments of Commerce and Labor appropriation bill.

Resumed consideration of H. R. 8531, the Treasury and Post Office Departments appropriation bill.

Mr. Heflin, Ala., D., spoke on the political conditions in North Carolina and Alabama.

Recessed.

House:

Passed H. R. 8299, authorizing the establishment of a national hydraulic laboratory in the Bureau of Standards of the Department of Commerce and the construction of a building therefor.

Agreed to conference report on H. R. 7960, the Civil War omnibus pension bill.

Representatives Shreve, Pa., R., Tinkham, Mass., R., Ackerman, N. J., R., Bacon, N. Y., R., Oliver, Ala., D., and Griffin, N. Y., D., were appointed conferees on H. R. 8960, the Departments of State and Justice, the Judiciary and the Departments of Commerce and Labor appropriation bill.

Adjourned.

Thursday, April 10, 1930

Senate:

Mr. Dill, Wash., D., spoke on the world court.

Resumed consideration of and passed H. R. 8531, the Treasury and Post Office Departments appropriation bill.

Began consideration of and passed H. R. 6564, the Interior Department appropriation bill.

Resumed consideration of S. 51, to subject certain immigrants, born in countries of the Western Hemisphere to the quota under the immigration laws.

Messrs. Harris, Ga., D., Bingham, Conn., R., and others discussed the bill.

Recessed.

House:

Representative Coyle, Pa., R., spoke on the relation of the District of Columbia to the Federal Government.

Resumed consideration of H. R. 10630, authorizing the President to consolidate and coordinate governmental activities affecting war veterans.

Adjourned.

Friday, April 11, 1930

Senate:

Resumed consideration of S. 51, to subject certain immigrants, born in countries of the Western Hemisphere to the quota under the immigration laws.

Messrs. Bingham, Conn., R., Blaine, Wis., R., Jones, Wash., R., and others spoke on the bill.

Began consideration of and passed H. R. 9546, the Independent Office appropriation bill.

Messrs. Phipps, Colo., R., Smoot, Utah, R., Jones, Wash., R., Harris, Ga., D., and McKellar, Tenn., D., were appointed conferees on H. R. 6564, the Interior Department appropriation bill.

Mr. Heflin, Ala., D., spoke on restriction of immigration.

Passed several minor bills.

Adjourned until Monday, April 14, 1930.

House:

Representatives Cramton, Mich., R., Murphy, Ohio, R., and Taylor, Colo., D., were appointed conferees on H. R. 6564, the Interior Department appropriation bill.

Agreed to H. Res., 207, electing Representative Wolverton, W. Va., R., a member of the standing committee of the House on Military Affairs.

Passed several bills on the consent calendar.

Adjourned until Monday, April 14, 1930.

Monday, April 14, 1930

Senate:

Agreed to conference report on H. R. 8960, the Departments of State and Justice, and the Judiciary, and the Departments of Commerce and Labor appropriation bill.

Mr. Blease, S. C., D., spoke on crime conditions in the District of Columbia.

Messrs. Keyes, N. H., R., Smoot, Utah, R., Jones, Wash., R., Overman, N. C., D., and Glass, Va., D., were appointed conferees on H. R. 9546, the Independent Offices appropriation bill.

Passed S. 3413, authorizing the Secretary of the Interior to make certain Colorado River investigations.

Passed S. 2113, to aid in effectuating the purposes of the Federal laws for promotion of vocational agriculture.

Passed 2354, amending the agricultural marketing act to include naval stores.

Passed several other bills on the consent calendar.

Recessed.

House:

Representatives Wason, N. H., R., Summers, Wash., R., and Woodrum, Va., D., were appointed conferees on H. R. 9546, the Independent offices appropriation bill.

Representative Montet, La., D., spoke on the sugar industry.

Representative Culkin, N. Y., R., spoke on H. R. 119, to prohibit sending stolen property through interstate and foreign commerce.

Representative Green, Fla., D., spoke on immigration.

Passed several bills on the consent calendar.

Adjourned.

Tuesday, April 15, 1930

Senate:

Agreed to conference report on H. R. 9546, the Independent Offices appropriation bill.

Resumed consideration of S. 51, to subject certain immigrants, born in countries of the Western Hemisphere to the quota under the immigration laws.

Executive session.

Recessed.

House:

Agreed, by a vote of 226 to 108 (not voting, 92), to the conference report on H. R. 8960, the State, Justice, Commerce and Labor Departments Appropriation bill.

Adopted H. Res., 205, providing for the immediate consideration of H. R. 10381, to extend the Government Compensation aid to World War veterans.

Representatives Purnell, Ind., R., Johnson, S. Dak., R., Rankin, Miss., D., and others spoke on the bill.

Adjourned.

Wednesday, April 16, 1930

Senate:

Passed S. 3585, to eliminate certain lands from the Tusayan National Forest, Ariz., as an addition to the Western Navajo Indian Reservation.

Resumed consideration of S. 51, to subject certain immigrants, born in countries of the Western Hemisphere to the quota under the immigration laws.

Messrs. Hayden, Ariz., D., Gould, Maine, R., Black, Ala., D., Allen, Kans., R., and others spoke on the bill.
Mr. Norris, Nebr., R., spoke on Muscle Shoals.
Executive session.
Adjourned.

House:

Administered the oath of office to Martin J. Kennedy, newly appointed Representative from New York to succeed Hon. John F. Carew, now a member of the New York State Supreme Court.
Passed S. 2757, authorizing the sale of certain United States property to Hoboken, N. J.
Adjourned.

Thursday, April 17, 1930

Senate:

Mr. Dill, Wash., D., spoke on the radio industry.
Messrs. Baird, N. J., R., Sullivan, Wyo., R., and Sheppard, Tex., D., were appointed conferees on H. R. 4138, amending the act relating to the pilgrimage of gold-star mothers and widows of deceased soldiers, sailors and marines.
Passed S. 3901, providing for the establishment of a commercial airport in the District of Columbia.
Passed several other bills on the calendar.
Resumed consideration of S. 51, to subject certain immigrants, born in countries of the Western Hemisphere to the quota under the immigration laws.
Messrs. Black, Ala., D., Heflin, Ala., D., Johnson, Calif., R., Phipps, Colo., R., Shipstead, Minn., F.-L., and others spoke on the bill.
Mr. Blaine, Wis., R., and others discussed the use of butter substitutes in Government institutions.
Mr. Norris, Nebr., R., and others discussed Muscle Shoals.
Recessed.

House:

Representatives Ransley, Pa., R., Wurzbach, Tex., R., and Quin, Miss., D., were appointed conferees on H. R. 4138, amending the act relating to the pilgrimage of gold-star mothers and widows of deceased soldiers and sailors and marines.
Agreed to conference report on H. R. 9546, the Independent Offices appropriation bill.
Resumed consideration of H. R. 10830, to extend the Government Compensation aid to World War veterans.
Adjourned.

Cyanimid *v.* Synthetic Nitrogen

Cyanimid

Continued from page 151

has been able to meet the competitive conditions of the fertilizer industry. Although it has shown remarkable development in the past twenty years, it has not yet reached the 100 per cent. limit of perfection, and there is still room for improvement in several directions. The use of its principal product as a basic raw material in the chemical industry affords considerable promise for the future, and it is far from the "obsolete" fixation process that it has been so often labeled.—*Extracts, see* 4, *p.* 160.

Synthetic

Continued from page 151

are on foot for substituting direct synthetic ammonia plants for cyanamide plants, and new developments in the direct synthetic ammonia process are being announced. By diverting the power now being used to fix the 40,000 tons of nitrogen as of the year 1925 by the arc process to the direct synthetic ammonia process, 100,000 tons of nitrogen could be fixed. One producer of cyanamide advises that " as a whole I think the production of cyanamide is at a standstill. The existing factories are probably used as far as possible, but no new factories will in my opinion be built, owing to the high production costs per ton of nitrogen compared with synthetic nitrogen." In parts of Europe, however, the market is still good for cyanamide and it is likely this market will continue for some time.—*Extracts, see* 5, *p.* 160.

EXECUTIVE DEPARTMENT

The White House Calendar

March 21 to April 17

Addresses

April 14—Address of President Hoover at the Thirty-ninth Continental Congress National Society, Daughters of the American Revolution, Washington, D. C.

Executive Orders

March 26—An executive order for the restoration of Power Site No. 436 on the Payette River.

April 4—An executive order abolishing New Bern and Manteo, N. C., as customs ports of entry.

April 4—An executive order reserving Lighthouse Reservation on Wolf Island, off Coast of Georgia for use by the Department of Agriculture as a refuge and breeding ground for wild animals and birds.

April 8—An executive order extending the limits of the port of Niagara Falls, N. Y., to include Lewiston, N. Y.

April 9—An executive order and amendment to the existing regulations relating to inspection of income tax returns in order to permit a statistical study by the Department of Commerce on returns filed by Corporations.

April 9—An executive order designating San Luis, Arizona, as a port of entry in Customs Collections District No. 26, Arizona.

April 14—An executive order withdrawing all unreserved islands, rocks and pinnacles situated in the Pacific Ocean off the Coast of California, for classification and in aid of legislation.

Proclamations

April 4—A proclamation adding certain lands to Ashley National Forest, Utah.

April 14—A proclamation adding certain lands to Yosemite National Park, California.

Important Civilian Appointment

March 21—John J. Parker, of North Carolina, to be an associate Justice of the Supreme Court of the United States.

March 21—Herbert D. Crosby and Luther D. Reichelderfer of the District of Columbia to be commissioners of the District of Columbia.

March 21—Banjamin M. Day, of New York, to be Commissioner of Immigration, port of New York.

April 1—John M. Cabot, of Massachusetts to be Consul of the United States of America.

April 1—William A. Bickers, of Virginia; and John M. Cabot of Massachusetts to be foreign service officers Class No. 8, of the United States.

April 1—Fred Cubberly, of Florida, to be U. S. Attorney, northern district of Florida.

April 1—Clark B. Wasson, of Oklahoma, to be U. S. Marshal, eastern district of Oklahoma.

April 1—Phil E. Baer, of Texas, to be U. S. Marshal, eastern district of Texas.

April 1—Edgar C. Snyder, of the District of Columbia, to be U. S. Marshal, District of Columbia.

April 3—Gerald A. Drew, of California; Sidney H. Browne, Jr., of New Jersey and Roger Sumner, of Massachusetts, to be secretaries in the Diplomatic service of the United States.

April 3—William J. Carter, of Tennessee, to be U. S. attorney, eastern district of Tennessee.

April 3—Roy C. Fox, of Washington, to be U. S. Attorney, eastern district of Washington.

April 3—Tom W. Dutton, of Louisiana, to be U. S. Marshal eastern district of Louisiana.

Communications to Congress

March 21—A communication from the President of the United States transmitting an estimate of appropriation for the United States Geographic Board of $1,100.

March 21—A communication from the President of the United States transmitting supplemental estimate of appropriation of $275,000 for the Employees Compensation Commission.

March 21—A communication from the President of the United States transmitting supplemental estimate of appropriation of $120,000 for the Department of State, for completing the construction and furnishing of buildings for the diplomatic and consular establishment in Tokyo, Japan.

March 21—A communication from the President of the United States transmitting an amendment to the supplemental estimate dated December 9, 1929, for $15,381,000 for eradication, control and prevention of the spread of the Mediterranean fruit fly.

March 21—A communication from the President of the United States transmitting supplemental estimate of appropriation of $30,000 for the Department of State, for the expenses of participation by the United States in the International Fur Trade Exhibition to be held in Leipzig, Germany, in 1930.

March 24—A communication from the President of the United States transmitting deficiency estimates of appropriations, amounting to $5,037.17, for the Department of Justice.

March 31—A communication from the President of the United States transmitting estimate of appropriation, of $25,000 for the Navy Department.

March 31—A communication from the President of the United States transmitting a draft of proposed legislation, affecting existing appropriations until June 30, 1931.

April 4—A communication from the President of the United States transmitting supplemental estimate of appropriation of $10,000 for the U. S. Board of Tax Appeals.

April 4—A communication from the President of the United States transmitting supplemental estimate of appropriation, of $350,000, for the Office of Public Buildings and Public Parks of the National Capital.

April 4—A communication from the President of the United States transmitting supplemental and deficiency estimates of appropriation of $2,400,780.43, for the Department of Interior, also a draft of the proposed legislation affecting an existing appropriation.

April 9—A communication from the President of the United States transmitting supplemental estimate of appropriation amounting to $100,000 for the Department of Interior.

April 11—A communication from the President of the United States transmitting a supplemental estimate of appropriation pertaining to the legislative establishment under the Architect of the Capitol.

April 11—A communication from the President of the United States transmitting five drafts of proposed legislation affecting existing appropriations for the War Department.

April 11—A communication from the President of the United States transmitting a supplemental estimate of appropriation, amounting to $148,200 for the George Washington Bicentennial Commission.

April 11—A communication from the President of the United States transmitting a supplemental estimate of appropriation amounting to $50,000 for the Department of Interior.

April 15—A communication from the President of the United States transmitting a draft of proposed legislation affecting an appropriation of the Office of Public Buildings and Public Parks of the National Capital.

April 17—A communication from the President of the United States transmitting supplemental estimate of appropriation, amounting to $299,157, for the Office of Public Buildings and Public Parks of the National Capital.

Provisions of House Resolution

Continued from page 142

ernment in the event of war with fair compensation to the lessee is required;

16. Permanent recapture by the Government in the event of failure of the lessee to comply with the terms of the lease must be provided. This does not apply to Cove Creek Dam nor Dam No. 3;

17. If the lease is negotiated in accordance with these provisions prior to December 1, 1931, then the cost of the construction of Cove Creek Dam shall be amortized at least partially by the collection of a reasonable royalty on all hydro-electric power projects now existing or to be constructed on the Tennessee or Clinch Rivers downstream from the Cove Creek Dam;

18. The State of Tennessee is given the right of recapture of the Cove Creek Dam upon the expiration of the license for its construction and operation;

19. The lessee must be an American citizen or a corporation controlled by American citizens;

20. The Board, subject to the approval of the President and subject to the principles enumerated in this resolution, may modify the terms of a lease when any portion of it has become impracticable on account of changed economic and technical conditions;

21. If the Board is unable to negotiate a lease by December 1, 1931, the President must notify Congress and all authority under the Act ceases.

Sources from Which Material in This Number Is Taken

Articles for which no source is given have been specially prepared for this number of THE CONGRESSIONAL DIGEST

1. Report of Senate Committee on Agriculture and Forestry, May 16, 1929. Report No. 19, 71st Cong., 1st Sess.
2. Congressional Record, April 4, 1930.
3. Congressional Record, Dec. 19, 1924.
4. The American Fertilizer, June 11, 1927.
5. Congressional Record, April 2, 1930.
6. Reports of the Engineer Corps, U. S. Army.
7. Congressional Record, April 3, 1930.

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